Canadian Farm Business Management Council

Conseil canadien de la gestion d'entreprise agricole

First Edition

MANAGING MARKET RISK

Introductory Course

Instructor's Resource Manual

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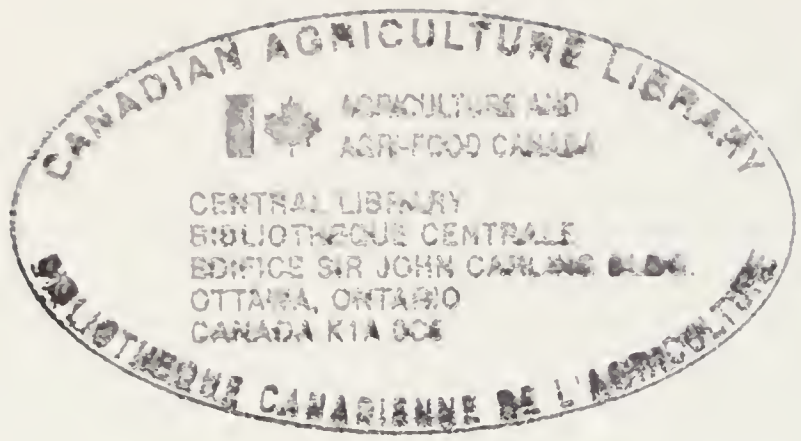

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or by visiting the **AAFC** internet site: http://www.agr.ca/policy/risk/risk_e.html

Canadian Farm Business Management Council

For other information on risk management tools please contact the Canadian Farm Business Management Council (CFBMC) at 1-888-232-3262;

or visit the **CFBMC** Internet site: http://www.cfbmc.com/eng/

Other Internet Sites

For information on Futures and options and for current price information the various exchanges maintain the following Internet sites:

The Chicago Board of Trade	http://www.cbot.com/index.html
The Chicago Mercantile Exchange	http://www.cme.com/
The Winnipeg Commodity Exchange	http://www.wce.mb.ca/index.html

Disclaimer

Information was taken from sources which were believed to be accurate at the time of printing. The reader should verify current contract specifications and other relevant information before using any of these products. The examples provided in the course material are purely for the purpose of illustration and should not be construed in any way as a recommended trading strategy or current market conditions.

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MANAGING MARKET RISK
- Introductory Course

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INTRODUCTION TO MANAGING MARKET RISK USING FUTURES, OPTIONS AND CASH MARKET CONTRACTS

Not a day goes by that we don't hear about inflation, interest rates, unemployment, cost of living, weather disasters, wars, government cutbacks, etc. All of these can result in some form of economic impact to each of us. In the world of agriculture, whether you are a grain or livestock producer, a processor or merchandiser, the inherent price risk associated with your operation cannot be ignored. An adverse price change can result in substantial economic loss at worst, or at best, reduced profits.

Managing market risk must be a key element in marketing and is increasing in importance as we move to a global economy and reduced government support programs. Risk can take on different forms in varying degrees depending on the individual or firm's financial position, cash flow position and need to avert risk.

Not all risks can be controlled or protected by insurance. Price risk is one such risk. As illustrated in the next chapter, price changes can have a dramatic financial impact on agri business. Increased market volatility as governments remove commodity specific programs, price supports and set aside programs will demand that attention be paid to risk management as a must for survival.

This course is designed to help the participant identify market risks and quantify those risks so that necessary risk management tools can be employed in their marketing plan.

Farming was once viewed romantically as a nice way of life. However, farming today, whether it be crop or livestock production, is highly specialized and heavily capitalized. It is this high capitalization of land, buildings and machinery exposing today's agri business to significant risk that warrants a study of risk management.

The ability to "lay off" price risk using futures markets make them a useful tool for grain and livestock producers, processors and merchandisers alike. Cash contracts and options on futures have links to futures markets that need to be addressed, explained and quantified so their uses can be better determined by the individual.

The objective of this course is NOT to make the participant a futures trader, but rather to introduce the concept of risk management as it pertains to farm marketing. Much time will be spent defining the terminology and jargon associated with futures and options to assist you in becoming familiar with how futures and options work and how prices for your products are determined. Also, the simple mechanics of futures trading for hedging (risk management) purposes will be defined and highlighted.

Upon completion of this course, the participant will have a good basic understanding of futures, options, and cash market contracts as farm marketing risk management tools. The participant will have the necessary knowledge and understanding to implement basic risk management strategies into their marketing plan and be well positioned for entry into a more advanced course on futures and options.

Suggested Time Allocation

This course has been designed to be delivered over three (3) full days. However, six evening classes of at least three full hours of training could be utilized. The days or evenings can be consecutive or spread out over a few weeks. Be careful not to have too much time between classes or material learned may be forgotten.

The first half of Day 1 should be used to get participants acquainted and discuss Market Risk. The second half of Day 1 is filled with discussing futures development and hedging.

As a facilitator, be sure to do regular checks with students as you move deeper into the material to ensure that they are grasping the concepts. The jargon and terminology is widely used so be sure you have a good understanding of these terms and define them regularly for your participants.

Use at least the first hour of Day 2 to review Day 1's material, particularly hedging. Review an exercise handed out the evening before and work through all stages with participants.

The balance of the morning of Day 2 should be used to explain basis. Use the afternoon of Day 2 to introduce options and their various components, terms and definitions. Send the participants home requesting that they review these terms over night.

Use the full morning of Day 3 to review terms and components of options and to illustrate their use. If more time is required after lunch, use it.

The balance of Day 3 should be used to review fully all aspects of hedging, options and cash contracts and how they might be incorporated on the farm. Follow the summary guide lines of Chapter 8 along with the charts showing the different strategy selections for each event. Refer to Chapter 6 for full definition and examples of the various cash contracts available.

UNDERSTANDING MARKET RISK ON THE FARM

Overview

There are three manuals for this course:
1. the student's workshop manual;
2. the instructor's manual and
3. the instructor's resource manual.

The instructor's manual has additional information for your information (*italics*) which is not contained in the student workshop manual. The instructor's resource manual provides some guidance on what to emphasis in the course, overheads on the major points and blank examples for the instructor to illustrate examples which are either more current or more relevant to your students.

This chapter is key in setting the stage for success in the course. Many people have a concept in mind about risk and risk management that is associated with barns burning down, crop failure and life insurance. These are certainly important, but the issue with which we need to deal here is the notion of price risk.

It is particularly important for those producers who do not use accounting information in decision making. The series of steps we go through to define market, price, gross margin, cash flow, and financial risk seem elementary but they help cement this concept of risk. These steps also give course participants a reference point as the hedging components are developed. We will make this reference quite explicit by revisiting examples several times throughout the remainder of the course.

Objectives

Upon completion of this Chapter, the participants will:

1. Understand the nature of risk in agricultural markets, and why having a good risk management plan in place is important for producers.

2. Know and understand the definition of market risk and to distinguish among the various types of market risk:

    a. Price Risk

    b. Gross Margin Risk

    c. Cash Flow Risk

    d. Financial Risk

3. Develop a foundation for understanding the nature of risk for their own business.

Suggestions to Facilitator

The major concepts here, in addition to the elements of risk, are:

- Price Volatility: is the degree to which prices move upwards or downwards over the course of time. Measure of market's sensitivity to the factors affecting supply and demand (weather, expectations, supplies of other commodities, stocks, etc.).

- Prices are likely to become more volatile in the future because of changes in the international policy environment.

- The relationship between the stocks/use ratios and price volatility is well documented and, with changes in US policy, the public financing of grain inventories will decline and could contribute to increased volatility in the future.

- Levels of government support have declined and producers will need to be more self reliant in the area of market risk management.

All of these make risk management more important over time.

To make these points, we have included overheads of the 1996 and 1997 corn contracts that are discussed in the text. They will become dated over time so you may want to use more current prices as a supplement.

If you use the futures charts, this will give you the opportunity to explain the daily bar charts. Some people may not have seen this type of chart before. The points which are of most interest are the high, low and close. We simply say that the high and low are plotted, joined with a straight line and the close is a "tic" on the right side of the bar.

After you begin to develop the risk concepts, refer them to the examples in Chapter 1. All of the examples have price variations, that are **much smaller than the actual variation in** 1996/97 corn prices. The higher actual volatility in these markets meant greater risk than these examples show this should be pointed out after you deal with some or all of the examples on price, gross margin, etc.

The examples are meant to be "in the ball park", but not precise, and not detailed. We did this purposely to be illustrative. If you try to go into a great deal of detail, people miss the principles. They will need to look at the specifics of their own operation after completing the course.

A good way to get people to think through their own risk situation is to wait until you finish this part of the course to introduce participants to each other. When they do, rather than having each person introduce themselves, ask them to work in pairs, find out each other's names, what kind of operation they have and describe the risk situation the operation faces in general terms.

At the end of this chapter or part way through Chapter 2, a very effective ploy is to compare a futures market speculator to a farmer who does not manage market risk (we call them cash market speculators). The differences are that the farmer pays the full cost of producing the product in the field, the barn or the bin, while the futures market speculator only pays the interest on margin. The cash market speculator may also have additional price risk because of basis and foreign exchange rate risk. The cash market speculator, when highly leveraged, is literally betting the farm.

Terminology to Define

The major terms to define are those in the objectives

- Market Risk
- Price Risk
- Gross Margin and Gross Margin Risk
- Cash Flow, Net Cash Flow and Cash Flow Risk
- Financial Risk
- Break Even

List of Overheads

Visual aids for this chapter include:

Overhead # Title

1. Chapter Objectives.
2. The September 1996 corn chart.
3. The March 1997 corn chart.
4. Barley Example.
5. Corn Example.
6. Canola Example.
7. Soybeans Example.
8. Western Feedlot Example.
9. Eastern Feedlot Example.
10. Hog Example.
11. Types of Market Risk.
12. Gross Margin Risk.
13. Chapter Summary
14. Questions at the End of the Chapter.

Exercise:

1. Will the management of market risk be less or more important in the future than in the past? Explain.

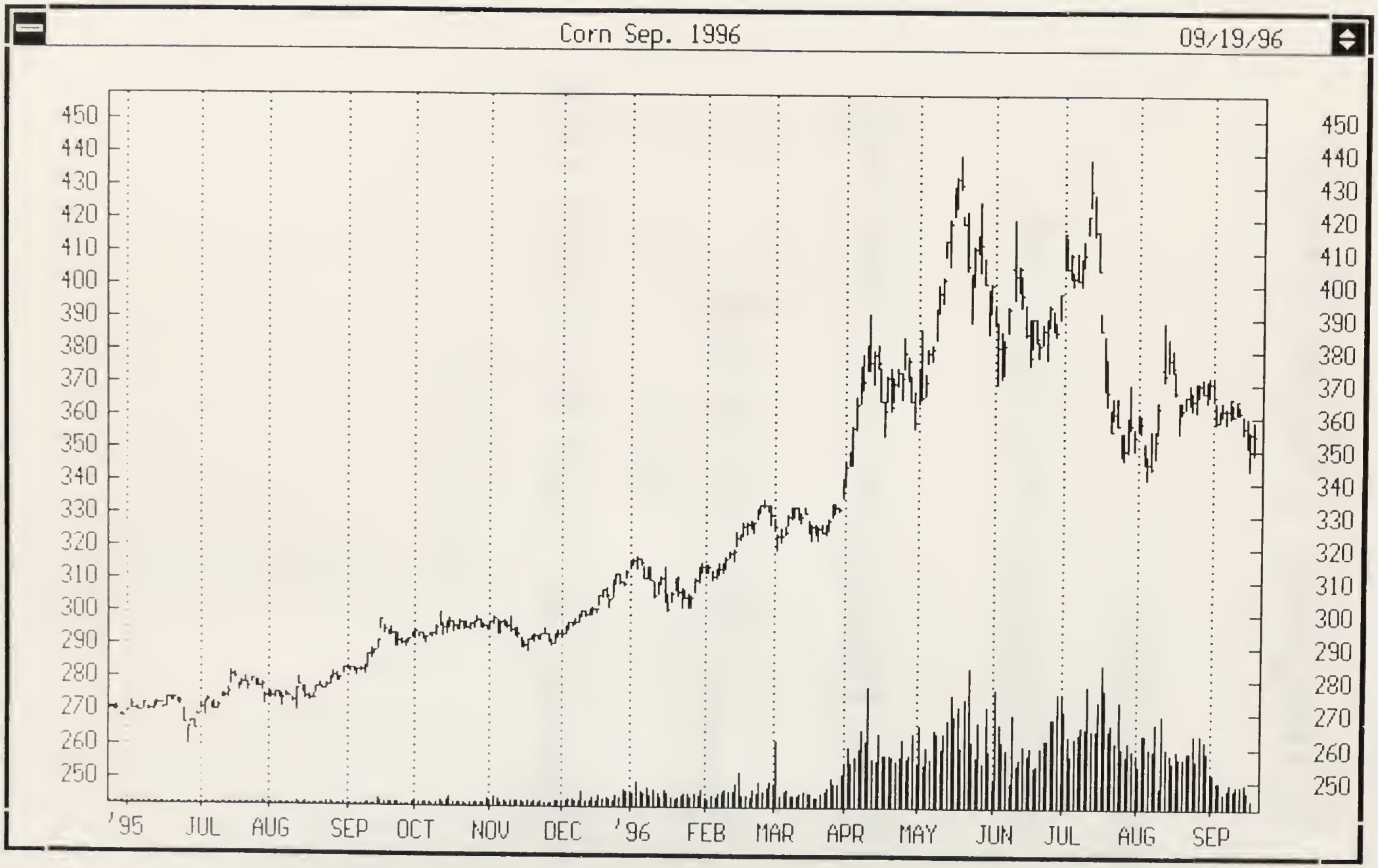
Answer: *Market risk management will be more important due to lower levels of government support and in the case of crops smaller carry over of US stocks than we are used to historically. Based on market signals, producers have more incentives now than in the past to move in and out of crops. These moves could add to the volatility as the market tries to "buy" or "discourage" production.*

Overheads For This Section

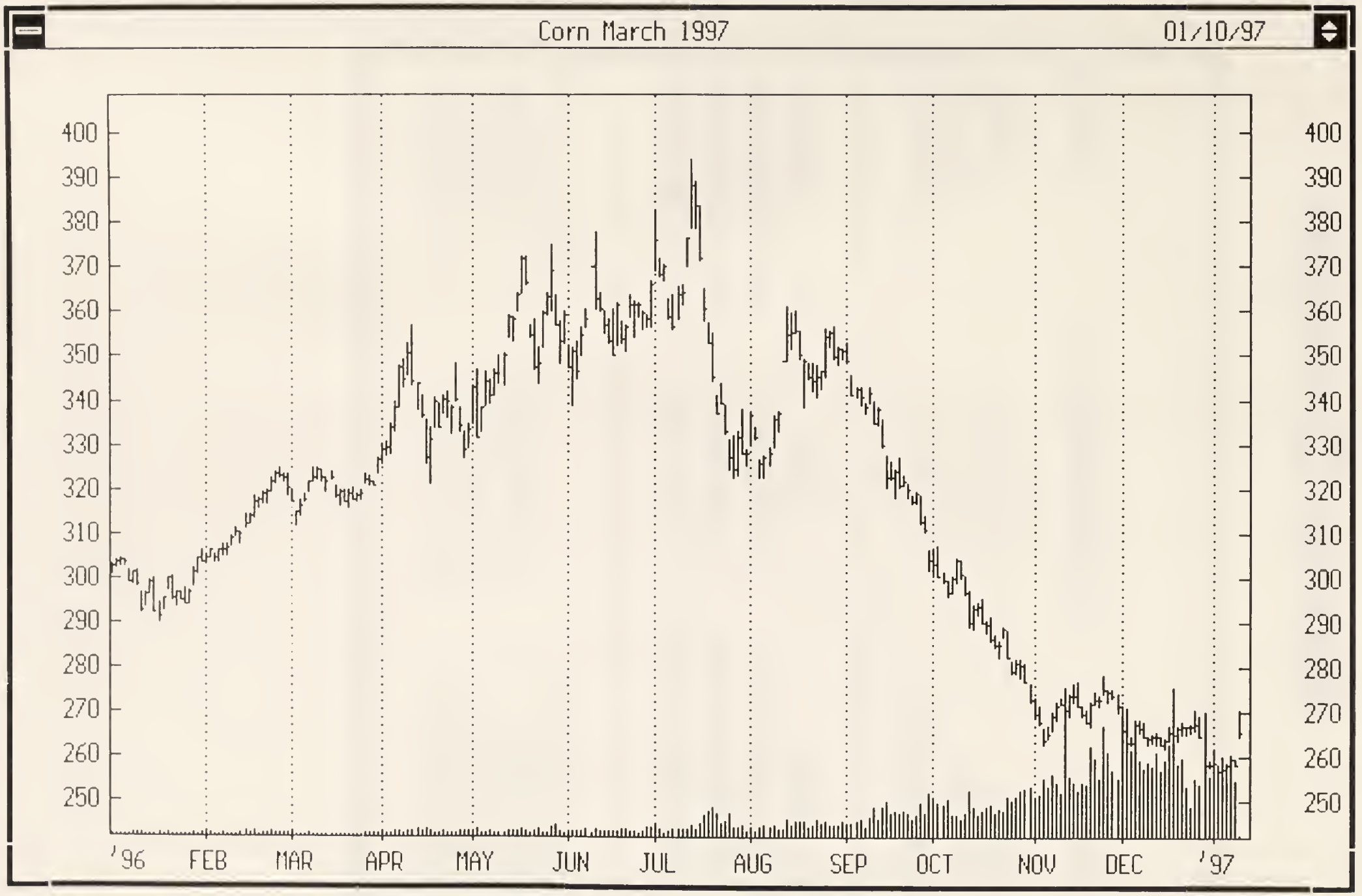
Chapter Objectives

Understand:

- Agricultural market risk
- Risk management planning
- Types of market risk
- Nature of your business risk



CHAPTER I OVERHEAD # 2


Corn March 1997
01/10/97
400
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
'96
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
'97

Barley Example

Result		Expected Result		Actual
If price	=	$2.40	=	$1.40
Cash Cost	=	$1.00	=	$1.00
Gross Margin	=	$1.40	=	$0.40
Yield/acre	=	90	=	90
Cash Inflow/acre	=	$216.00	=	$126.00
Cash Outflow/acre	=	$ 90.00	=	$ 90.00
Net Cash Flow/acre	=	$126.00	=	$ 36.00
With 200 acres				
Cash Inflow	=	$43,200	=	$25,200
Cash Outflow	=	$18,000	=	$18,000
Net Cash Flow	=	$25,200	=	$ 7,200

Corn Example

Result		Expected Result		Actual
If price	=	$3.50	=	$2.50
Cash Cost	=	$3.00	=	$3.00
Gross Margin	=	$0.50	=	($0.50)
Yield/acre	=	120	=	120
Cash Inflow/acre	=	$420.00	=	$300.00
Cash Outflow/acre	=	$360.00	=	$360.00
Net Cash Flow/acre	=	$60.00	=	($60.00)
With 500 acres				
Cash Inflow	=	$210,000	=	$150,000
Cash Outflow	=	$180,000	=	$180,000
Net Cash Flow	=	$ 30,000	=	($30,000)

Canola Example

Result		Expected Result		Actual
If price	=	$7.50	=	$5.50
Cash Cost	=	$2.75	=	$2.75
Gross Margin	=	$4.75	=	$2.75
Yield/acre	=	35	=	35
Cash Inflow/acre	=	$262.50	=	$192.50
Cash Outflow/acre	=	$ 96.25	=	$ 96.25
Net Cash Flow/acre	=	$166.25	=	$ 96.25
With 200 acres				
Cash Inflow	=	$52,500	=	$38,500
Cash Outflow	=	$19,250	=	$19,250
Net Cash Flow	=	$33,250	=	$19,250

Soybeans Example

Result		Expected Result		Actual
If price	=	$8.00	=	$6.00
Cash Cost/bu	=	$6.25	=	$6.25
Gross Margin	=	$1.75	=	($0.25)
Yield/acre	=	40	=	40
Cash Inflow/acre	=	$320.00	=	$240.00
Cash Outflow/acre	=	$250.00	=	$250.00
Net Cash Flow/acre	=	$70.00	=	($10.00)
With 500 acres:				
Cash Inflow	=	$160,000	=	$120,000
Cash Outflow	=	$125,000	=	$125,000
Net Cash Flow	=	$ 35,000	=	($ 5,000)

Western Feedlot Example

		Expected Result		Actual Results Scenario I	Scenario II	Scenario III
If price - cattle	=	$93.00/cwt	=	$85.00/cwt	$93.00/cwt	$85.00/cwt
- barley	=	$3.00/bu	=	$3.00/bu	$3.50/bu	$3.50/bu
Total Cost/head	=	$1,140.00	=	$1,140.00	$1,165.00	$1,165.00
Break even/cwt	=	$91.20	=	$91.20	$93.20	$93.20
Gross margin/cwt	=	$1.80	=	($6.20)	($0.20)	($8.20)
Cash Inflow/head	=	$1,162.50	=	$1,062.50	$1,162.50	$1,062.50
Cash Outflow/head	=	$1,140.00	=	$1,140.00	$1,165.00	$1,165.00
Net Cash flow/head	=	$22.50	=	($77.50)	($2.50)	($102.50)
With 1,000 head:						
Cash Inflow	=	$1,162,500	=	$1,062,500	$1,162,500	$1,062,500
Cash Outflow	=	$1,140,000	=	$1,140,000	$1,165,000	$1,165,000
Net Cash flow	=	$22,500	=	($77,500)	($2,500)	($102,500)

Eastern Feedlot Example

		Expected Result		Actual Results: Scenario I	Scenario II	Scenario III
If price - cattle	=	$80.00/cwt	=	$75.00/cwt	$80.00/cwt	$75.00/cwt
- corn	=	$2.50/bu	=	$2.50/bu	$3.50/bu	$3.50/bu
Total Cost/head	=	$975.00	=	$975.00	$1,025.00	$1,025.00
Break even/cwt	=	$78.00	=	$78.00	$82.00	$82.00
Gross margin/cwt	=	$2.00	=	($3.00)	($2.00)	($7.00)
Cash Inflow/head	=	$1,000.00	=	$937.50	$1,000.00	$ 937.50
Cash Outflow/head	=	$975.00	=	$975.00	$1,025.00	$1,025.00
Net Cash flow/head	=	$25.00	=	($37.50)	($ 25.00)	($ 87.50)
With 1,000 head:						
Cash Inflow	=	$1,000,000	=	$937,500	$1,000,000	$937,500
Cash Outflow	=	$975,000	=	$975,000	$1,025,000	$1,025,000
Net Cash Flow	=	$ 25,000	=	($ 37,500)	($ 25,000)	($ 87,500)

Hog Finishing Example

						Actual Results		
		Expected Result		Scenario I		Scenario II		Scenario III
If price - hogs	=	$145.00/hog	=	$125.00/hog		$145.00/hog		$125.00/hog
- corn	=	$3.50/bu	=	$3.50/bu		$4.00/bu		$4.00/bu
Total Cost/hog	=	$126.25	=	$126.25		$130.00		$130.00
Break even/hog	=	$126.25	=	$126.25		$130.00		$130.00
Gross margin/hog	=	$18.75	=	($ 1.25)		$ 15.00		($ 5.00)
Cash Inflow/hog	=	$145.00	=	$125.00		$145.00		$125.00
Cash Outflow/hog	=	$126.25	=	$126.25		$130.00		$130.00
Net Cash flow hog		$18.75	=	($ 1.25)		$ 15.00		($ 5.00)
With 1,000 hogs:								
Cash Inflow	=	$145,000	=	$125,000		$145,000		$125,000
Cash Outflow	=	$126,250	=	$126,250		$130,000		$130,000
Net Cash flow	=	$ 18,750	=	($ 1,250)		$ 15,000		($ 5,000)

Types of Market Risk

1. Price risk

2. Gross margin

3. Cash flow risk

4. Financial risk

Gross Margin Risk

Commodity	Expected Gross Margin	Actual Gross Margin	Decline from Expected Margin (%)
Barley	$1.40/bu	$0.40/bu	71%
Corn	$0.50/bu	($0.50/bu)	200%
Canola	$4.75/bu	$2.75/bu	42%
Soybeans	$1.75/bu	($0.25/bu)	114%
Feedlot (west)*	$1.80/cwt	($8.20/cwt)	556%
Feedlot (east)*	$2.00/cwt	($7.00/cwt)	450%
Hogs*	$18.75/hog	($5.00/hog)	127%

* Actual margin based on a fall in price and increased feed costs.

Chapter Summary

- The types of market risk:
  - price
  - cash flow
  - margin
  - financial

- cash market has more risk than speculation.

- Producers more self-reliant.

- Risk management has become more relevant.

- Numerous instruments to manage risk.

Questions

1. Will the management of market risk be less or more important in the future than in the past? Explain.

2. For one or more enterprises on your farm, indicate:

    a. Your expected price per unit for the next year.

    b. Your expected cash cost per unit for the next year.

    c. Your expected gross margin for the next year.

    d. Your expected net cash flow for the next year.

    e. What the effect will be on gross margins and net cash flow if your selling price for the commodity is 40% less than your expected price.

    f. What will the effect be on gross margins and net cash flow if your purchase price for a commodity input is 50% more than expected.

FUTURES MARKETS

Overview

This section is designed to give students knowledge of why and how the futures markets evolved. The material discussed includes, the mechanics of how a futures contract trades, their design and the processes in place ehich ensures financial integrity and contract compliance. It also addresses the role that the clearing corporation plays in handling the daily bookkeeping which is required as part of the margin process and as the guarantor to all the parties involved in a futures transaction.

Objectives

At the end of this Chapter, the participants will:

1. Know why and how futures markets evolved.
2. Understand the nature of the futures contract.
3. Understand the margin process.
4. Understand the difference between cash and futures markets.
5. Understand the role of arbitrage in linking cash and futures prices.

Suggestions to Facilitators

To help the student comprehend the material basic economic concepts of a competitive marketplace should be reviewed or incorporated early into the lesson.

Supply

The amount a commodity producers are willing and able to provide (sell) at various prices at a given point in time.

Demand

The quantity of a commodity consumers are willing and able to buy at various prices at a given point in time.

Competitive Markets

Provides a time and place where buyers can compete to buy and sellers can compete to sell. The supply and demand information and expectations for changes in supply and demand are reflected in buyers' bids and sellers' offers. The more competitive the marketplace, the closer bids and

offers will be, and hence the price fluctuations will be smaller between trades.

Development of Futures Markets

Review the development of the futures market, with **emphasis** on the effects of erratic price swings throughout year (i.e. lack of storage facilities) and the effects of contract defaults.

Forward markets helped to reflect the costs of storing grain to later periods which encouraged entrepreneurs to develop storage facilities. Formalized exchanges enhanced the public image and visibility of the marketplace. Increased traffic and economic activity in cities where exchanges existed (i.e. Chicago, Winnipeg) boosted the local economy. Members and interested parties gained exposure and political clout. This allowed them to lobby for infra-structure improvements such as roads, waterways which attracted even more activity. However, contract defaults and the lack of price discovery/comparison were still a problem. Standardized contracts and margin procedures that came with the futures contracts resolved the price discovery/comparison and reporting concerns and eliminated contract defaults.

Futures exchanges and the products which they trade have expanded over the past 100 years to include: stock indexes, currencies, precious metals, financial instruments and numerous agricultural commodities.

FUTURES MARKETS AND CONTRACT CHARACTERISTICS

Futures Contract

Emphasize the standardization of the contract. Use contracts which are of interest to your audience, to show how various futures contracts predetermine: quality, quantity, delivery location and time (futures months traded). A comparison of differences between a cash forward contract and a futures contract is useful.

Show the hours of trading, the minimum price fluctuations and the maximum daily price moves to demonstrate the functions of an exchange in providing the time and place for buyers and sellers to meet in a formalized manner. The other functions of a exchange should also be described. Stress the differences between hedgers and speculators in terms of motivation.

The Threat of Delivery

An important introduction to the concept of hedging, is to explain the relationship between cash and futures and how arbitragers ensure cash and futures prices follow each other as closely as possible. This further enhances the financial integrity of the futures contract as price disparities between cash and futures are minimize. The competition amongst arbitragers to profit from any price disparity ensures that the price disparity is minimized.

THE CASH SETTLED CONTRACT

Convergence of a cash settled contract is ensured at maturity through the final settlement price which is set equal to the actual underlying cash price index.

Prior to expiry, if the futures price is high relative to the cash price index prior to final settlement, there is an incentive for the longs and other individuals to sell the futures causing the futures price to fall. By selling the contract back now, a long position will capture a profit which may disappear by holding the position to expiry at which time the futures settlement price will equal the actual underlying cash price index. At the same time, those individuals who need the physical product may view the cash price as being too low and buy physical product creating higher a cash price.

Similarly, if futures prices appear low relative to the cash price index, there is an incentive for the shorts and other individuals to buy the futures prior to expiry causing futures price to increase. By buying the futures contract back now, a short position will capture a profit which may disappear by holding the position to expiry at which time the futures settlement price will equal the underlying cash price index. At the same time, those individuals who are holding physical product may view cash prices as being too high and sell off additional product causing a decline in cash prices. In either case, the cash and futures markets will converge as the final settlement date approaches.

The Margining Process

Explain that the strict rules and regulations governing exchange members along with the margin process ensures that future markets have the highest financial integrity. This integrity is critical to the success of a future markets. If there was no integrity, people would not use the markets.

The explanation and illustration of a Clearing Association, futures markets attributes and a discussion of margins helps to explain compliance by the buyer and the seller on the contract and thus, financial integrity. Explain the concept of margin calls and work through the margin example.

Mechanics of a Simple Hedge

Hedging with futures protects a producer from an adverse price move. The objective is not to make money with futures, unlike the objective of the speculator. In the course we refer to hedging with futures as a **"zero sum gain"**. It is important for you the "facilitator" to stress: **"What is lost in the futures market is offset by a gain in the cash market or vice versa"**. Producers should always calculate the profit and loss in both markets to assess the results of their hedge. Chapter 5 will cover hedging in detail.

Explain the mechanics of a short hedge first because most producers will identify with the concept of selling a futures contract. Once they understand the short hedge then talk about the long hedge. Make sure that they now realize that they are sitting on the opposite side of the table from the seller and that they are now the buyer.

Terminology to define in this section:

- Futures Markets
- Futures contracts
- Liquidity
- Efficiency
- Standardization
- Long (Buy)
- Short (Sell)
- Margins
  - initial margin
  - maintenance (variation) level
  - margin call
- Price Discovery
- Zero Sum Gain
- Hedgers
- Threat of delivery
- Arbitrage
- Speculators
- Offset
- Cash Settled Contacts
- Basis
- Cash markets
- Forward contract

List of Overheads

Visual aids for this chapter include:

Overhead # **Title**

1. Chapter Objectives.
2. Development of Futures Markets
3. Futures Contract.
4. Trading of Futures Contracts.
5. Futures Exchange.
6. The Clearing House
7. Futures Trades.
8. The Standardized Futures Contract.
9. Forward Versus Futures Contracts.
10. Attributes Of A Futures Market.
11. Price Discovery.
12. Price Risk Management.
13. Liquidity.
14. Efficiency.
15. Zero sum Gain.
16. Hedgers.
17. Speculators.
18. Going Long - Hedger
19. Going Short - Hedger.
20. Basis.
21. Cash Markets.
22. Threat Of Delivery.
23. Arbitrage.
24. Cash Settled Futures Contracts.
25. The Margin Process.
26. Marked To Market.
27. Maintenance/Variation Margins.
28. Excess Margin.
29. Margin Example.

30. Closing Out Short Position.
31. Closing Out Long Position.
32. Short Hedge - Futures Price.
33. Short Hedge - Cash Price.
34. Short Hedge - Price Increase.
35. Short Hedge - Price Decline.
36. Chapter Summary.
37. Futures Market Quiz.
38. Short Hedge Exercise - Barley.
39. Short Hedge Exercise - Barley Answer.
40. Short Hedge Exercise - Corn.
41. Short Hedge Exercise - Corn Answer.
42. Short Hedge Exercise - Hogs.
43. Short Hedge Exercise - Hogs Answer.
44. Short Hedge Exercise - Canola.
45. Short Hedge Exercise - Canola Answer.
46. Short Hedge Exercise - Cattle.
47. Short Hedge Exercise - Cattle Answer.
48. Short Hedge Exercise - Blanks (4).
52. Long Hedge Exercise - Barley.
53. Long Hedge Exercise - Barley Answer.
54. Long Hedge Exercise - Corn.
55. Long Hedge Exercise - Corn Answer.
56. Long Hedge Exercise - Blanks (4).

FUTURES MARKET QUIZ - *Answer Sheet*

1. ***The interaction of buyers and sellers and the competition between buyers and sellers in the futures market help to discover _____ and provide for a _____ marketplace.***

   a) competition, noisy
   b) price, liquid
   c) futures, central,
   d) standardization, new

2. ***Futures markets evolved from cash markets to cash forward markets out of _____.***

   a) chaos caused by the Roman Empire
   b) chaos caused by erratic supply, poor storage facilities and large price swings
   c) desperation by men who wanted to fix prices

3. ***Futures markets are traded on the floor of the exchange where price is determined by:***

   a) the Clearing Association
   b) auction, open outcry
   c) ticker tape
   d) exchange observers

4. ***Margin money in futures markets is referred to as:***

   a) good faith, earnest money
   b) profit
   c) space on a page
   d) the broker's fee

Hedge Exercises

Short Hedges:

Barley

TRANSACTION	NOV. CASH (Physical)	DEC. FUTURES
APRIL 15: Long Cash Sell (Short) DEC. futures	Expected Price $120.00/mt.	$145.00/mt.
NOVEMBER 1: Sell (Short) Cash **Buy (Long)** Dec. Futures	Actual Sale Price **$90.00/mt.**	$115.00 /mt.
Profit (Loss)	**($30.00/mt.)**	**$30.00/mt.**
Gain on **FUTURES** offsets Loss on the **CASH** Price		

The gain on the futures offset the loss on the cash transaction side of ***the hedge*** equation. The producer realized the expected price of $120.00/mt.

Corn

TRANSACTION	NOV. CASH (Physical)	DEC. FUTURES
APRIL 15: Long Cash Sell (Short) DEC. futures	Expected Price $3.50/bu	$3.85/bu
NOVEMBER 1: Sell (Short) Cash **Buy (Long)** Dec. Futures	Actual Sale Price **$2.50/bu**	$2.85/bu
Profit (Loss)	**($1.00/bu)**	**$1.00/bu**
Gain on **FUTURES** offsets Loss on the **CASH** Price		

The gain on the futures offset the loss on the cash transaction side of ***the hedge*** equation. The producer realized the expected price of $3.50/bu.

Hogs

TRANSACTION	NOV. CASH (Physical)	DEC. FUTURES
APRIL 15: Long Cash Sell (Short) DEC. futures	Expected Price $150.00/ckg	$160.00/ckg
NOVEMBER 1: Sell (Short) Cash **Buy (Long)** Dec. Futures	Actual Sale Price $120.00/ckg	**$130.00/ckg**
Profit (Loss)	**($30.00/ckg)**	**$30.00/ckg**
Gain on **FUTURES** offsets Loss on the **CASH** Price		

The gain on the futures offset the loss on the cash transaction side of ***the hedge*** equation. The producer realized the expected price of $150.00/ckg.

Canola

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) DEC. futures	Expected Price $353.00/mt.	$360.00/mt.
NOVEMBER 1: Sell (Short) Cash **Buy (Long)** Dec. Futures	Actual Sale Price $378.00/mt.	$385.00 /mt.
Profit (Loss)	**$25.00/mt.**	**($25.00/mt.)**
Gain on **Cash** offsets Loss on the **Futures** Price		

The gain on the futures offset the loss on the cash transaction side of ***the hedge*** equation. The producer realized the expected price of $353.00/mt.

Slaughter Cattle

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) DEC. futures	Expected Price $88.00/cwt.	$96.00/cwt.
NOVEMBER 1: Sell (Short) Cash **Buy (Long)** Dec. Futures	Actual Sale Price **$95.00/cwt.**	**$103.00/cwt.**
Profit (Loss)	**$7.00/cwt.**	**($7.00/cwt.)**
Gain on **Cash** offsets Loss on the **FUTURES** Price		

The gain on the cash offsets the loss on the futures transaction side of ***the hedge*** equation. The producer realized the expected price of $88.00/mt.

Long Hedges;

Barley

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Short Cash Buy (Long) Jul. futures	Expected Price **$100.00/mt.**	$125.00/mt.
May 20: Buy (Long) Cash **Sell (Short)** Jul. Futures	Actual Sale Price **$130.00/mt.**	$155.00/mt.
Profit (Loss)	**($30.00/mt.)**	**$30.00/mt.**
Gain on **FUTURES** offsets Loss on the **CASH** Price		

The gain on the futures offset the loss on the cash transaction side of ***the hedge*** equation. The producer realized the expected cost of $130.00/mt.

CORN

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Short Cash Buy (Long) Jul. futures	Expected Price $3.00/bu	$3.25/bu
May 20: Buy (Long) Cash **Sell(Short)** Jul. Futures	Actual Sale Price **$3.90/bu**	$4.15/bu
Profit (Loss)	**($0.90/bu)**	**$0.90/bu**
Gain on **FUTURES** offsets Loss on the **CASH** Price		

The gain on the futures offset the loss on the cash transaction side of ***the hedge*** equation. The producer realized the expected cost of $3.00/bu.

Overheads For This Section

Chapter Objectives

Understand:

- Futures markets
- Margin process
- Difference between futures and cash markets
- Link between cash and futures prices

Development of Futures Markets

- Early Markets

- Forward Markets:
  - CBOT 1848
  - Contract standardization

- Future Markets:
  - Transfer of risk (hedging)
  - 1982 option trading

Futures Contract

- Binding legal contract
- Standardized
- Prices negotiated by open outcry

Trading of Futures Contracts

- Every trade has a buyer and seller.
- The Seller ⇨ promises to make delivery.
- The Buyer ⇨ promises to take delivery.

Futures Exchange

- Provides trading facilities.
- Sets trading rules.
- Establishes a clearing house or an association.
- Research & development
- **DOES NOT SET PRICES.**

The Clearing House

- Legal entity
- Guarantor to both buyer and seller
- Sets, manages & monitors margins.

Futures Trades

The Standardized Futures Contract

Quantity	⇨ 20 metric tonnes	⇨ for canola, barley, feed wheat on (WCE)
Quality	⇨ #1 Canada Canola, #2 Canola at discount (WCE)	⇨ Deliverable grades predetermined by the Exchange,
Location	⇨ Par Area - 150 km radius around Saskatoon for canola	⇨ Pre-defined areas, locations, facilities where physical delivery can be used to satisfy a short futures position.
Time	⇨ NOVEMBER canola	⇨ Each contract is specific about its delivery period within a particular month.
Price (not pre-defined)	⇨ For example, the WCE canola futures price can only move in increments of $.10/tonne to a daily maximum of plus or minus $10.00/tonne versus the previous day's settlement price.	⇨ The price is not predetermined and is negotiated by open outcry between buyers and sellers. The Exchanges monitor price levels and sets minimum levels for price movements and maximum daily price movements.

Forward Versus Futures Contracts

CONTRACT ELEMENT	FORWARD CONTRACTS	FUTURES CONTRACTS
Price	Negotiated privately	Open outcry
Quantity Quality Delivery Date Delivery Location	Negotiated privately	Standardized
Transfer of Physical Product	Expected	Rarely occurs

Attributes of A Futures Market

- Price Discovery
- Price Risk Management
- Liquidity
- Efficiency
- Zero Sum Gain
- Hedgers
- Speculators

Price Discovery

- Ongoing changes to supply and demand.
- New market Information reflected in trades.
- Price reported for each trade.

Price Risk Management

- Hedgers have or expect to have cash position.
- Transfers price risk - use offsetting futures position.
- Major justification for futures markets

Liquidity

- Key to the success of a futures markets
- Enter and exit the market, without price impact.

Efficiency

- Low transaction cost
- Enhances liquidity

Zero Sum Gain

- Buyer for every seller
- Profits equal losses

Hedgers

- Interest in the physical commodity
- Takes an opposite futures position
- Reduces price risk

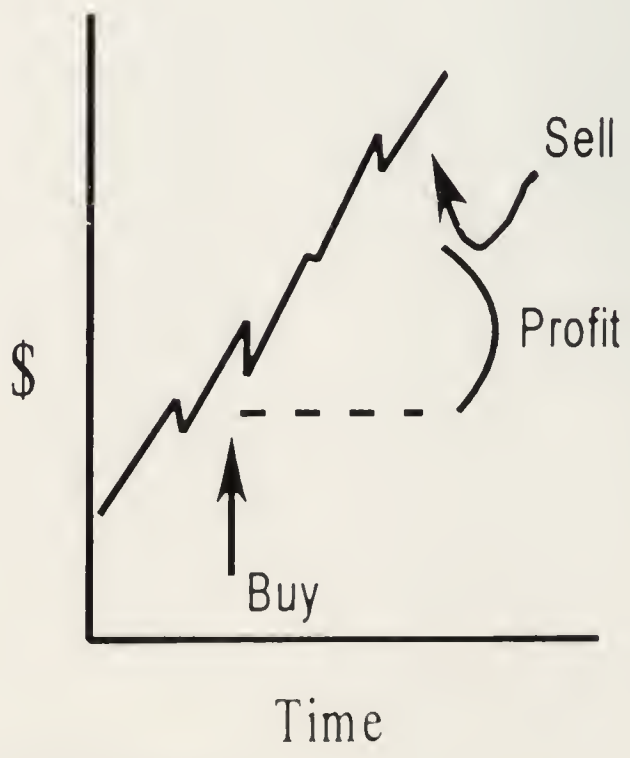
Speculators

- No interest in the physical commodity
- Objective ⇨ profit
- Expectations of price change ⇨ buy or sell

Going Long - Hedger

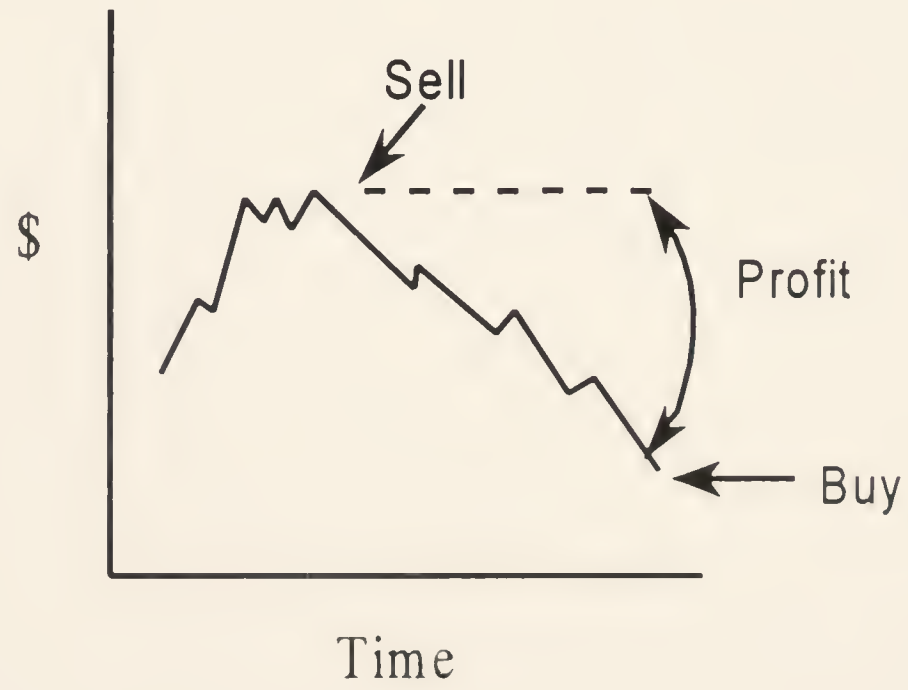
- Hedger ⇨ will need the physical commodity.
- Buy futures contract.
- Futures market gains/losses offset in cash market

- Example: feedlot needing grain in the future.



Going Short - Hedger

- Sell a futures contract.
- Hedger ⇨ has or expects to, physical commodity.
- Futures market gains/losses offset in cash market
- Producers of grain, oilseeds or livestock.



Basis

- Threat of delivery link between cash and futures
- Cash/futures relationship measured by basis
- Basis = local cash price minus relevant futures

Cash Markets

- Localized markets
- Bilaterally negotiation of all terms
- Physical commodity is exchanged

Threat of Delivery

- Physical delivery on futures possible

- Cash and futures generally move in the same direction:
  - not always by the same amount.

Arbitrage

- Buying in market and selling in another related market.
- Ensures cash and futures converge.

Cash Settled Contracts

- No delivery

- Convergence ensured:
  - settlement price is underlying cash price index.

- Futures Price High relative to cash price index:
  - incentive to sell futures, buy cash.

- Futures Price low relative to Cash price index:
  - incentive to buy futures sell cash.

The Margining Process

- Futures position must be margined.
- Cash or securities are initial margin.
- "Good faith" or "earnest"money
- Minimum margin requirements set by Exchange.
- Brokers may have higher initial margins.

Marked to Market

- Closing futures price used to balance all open positions.
- Futures positions marked to market daily.
- Each futures position must equal:
  ⇨ cash + initial transaction price = settlement price.

Maintenance/Variation Margins

- Set by the Exchange.

- Adverse market move:
  - ⇨ **margin account debited;**
  - ⇨ if Account below maintenance level;
  - ⇨ **deposit funds by the next business day.**

- Request for funds is a **margin call**.

Excess Margin

- Accounts are credited if favourable market move.
- Unrealized gains are **excess margin.**

Margin Example

Assumptions:

Margin Requirements

-Initial margin = $230.00 per contract

-Maintenance level = $160.00 per contract

	"A" Buys		"B" Sells
Account Deposit	$2,300.00		$2,300.00
Initial Margin	($2,300.00)	Day 1: "A" buys 10 NOV canola @ $400 "B" sells 10 NOV canola @ $400	($2,300.00)
Account Balance	$2,300.00		$2,300.00
Unrealized Gain/(Loss)	$1,000.00	Day 2: NOV futures rise to $405	($1,000.00)
Account Balance	$3,300.00		$1,300.00
Margin call for "B"	$0.00		$1,000.00
Account Balance	$3,300.00		$2,300.00

Closing Out Short Position

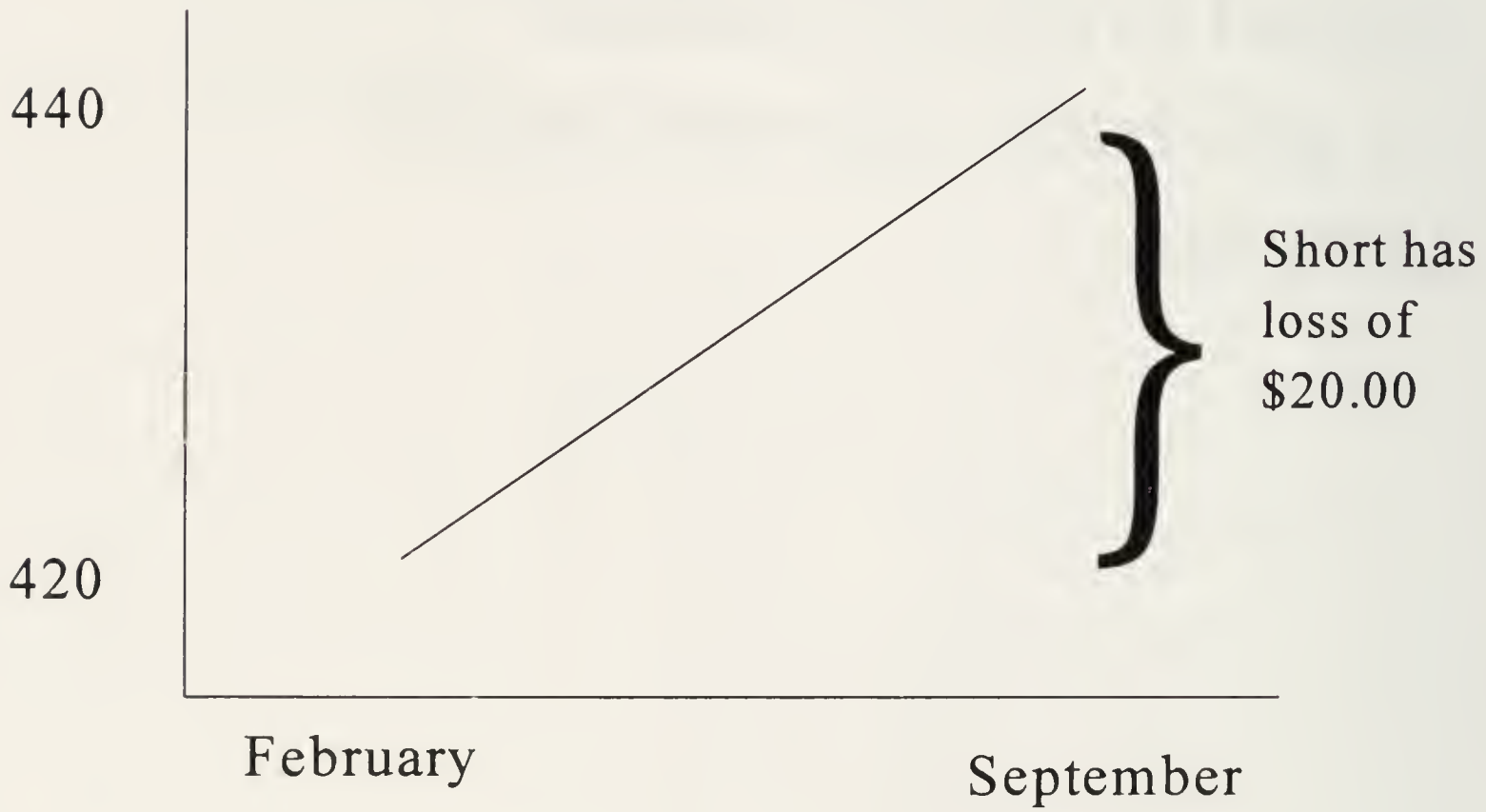
- Deliver and accept payment, or
- Offset original position:
  ⇨ buy back relevant futures contracts

Closing Out Long Position

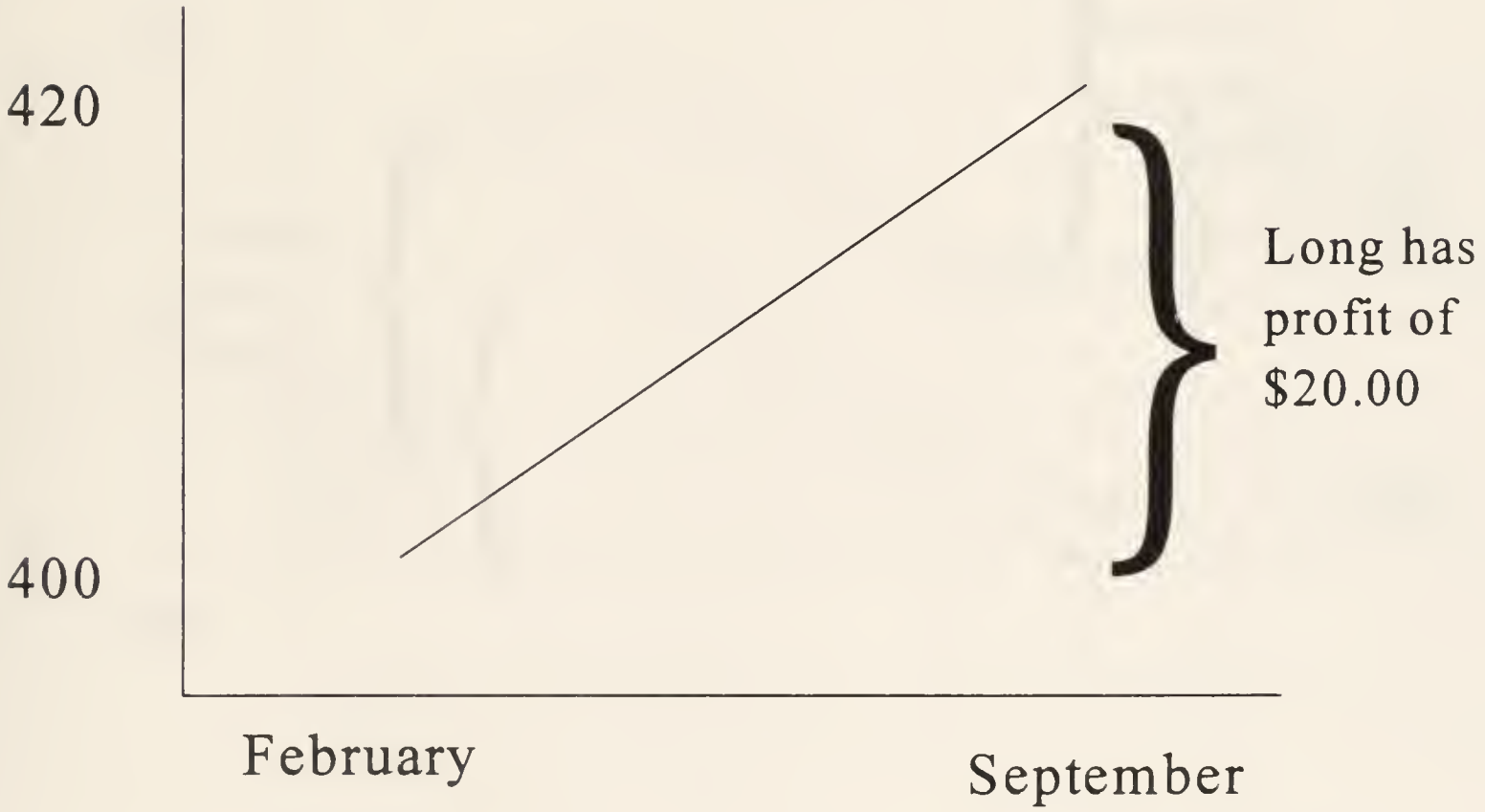
- Take delivery and pay for it in full, or

- Offset original position:
  ⇨ sell back relevant futures contracts

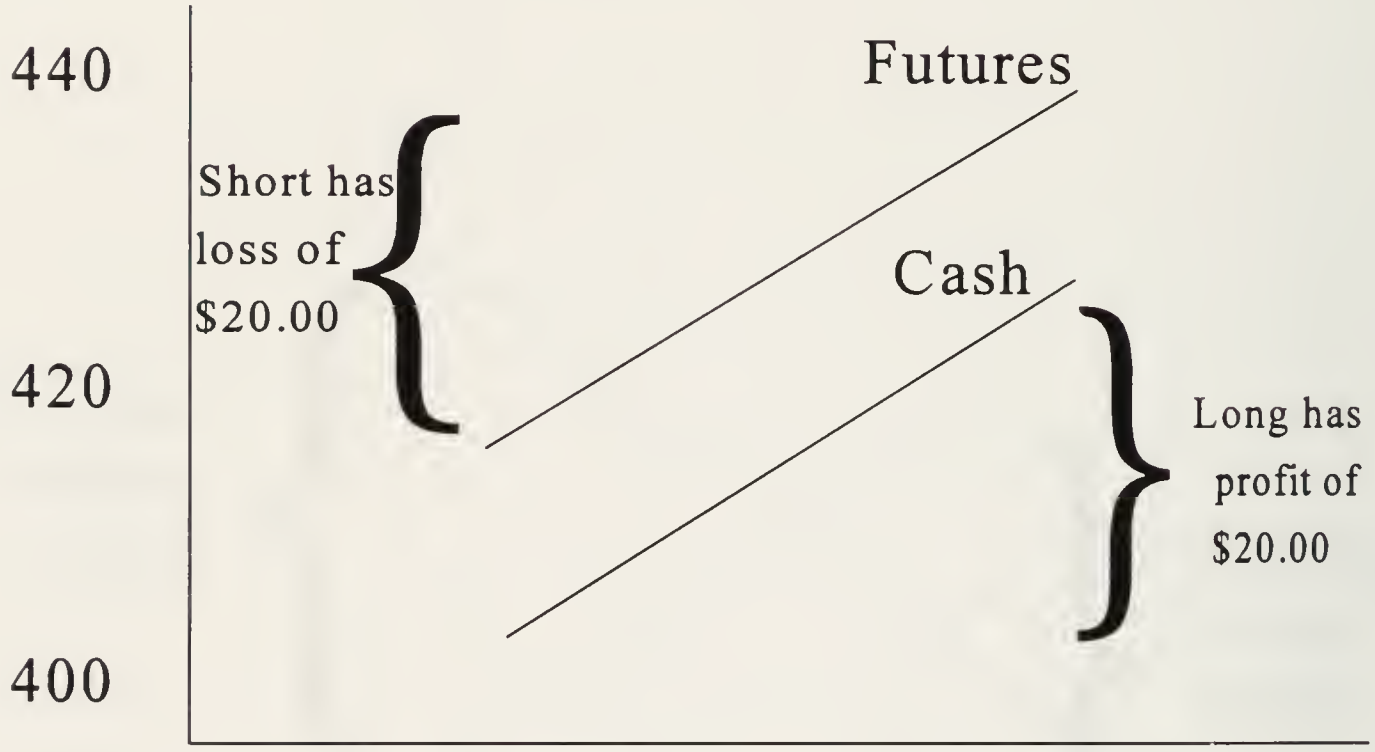
October Futures Price - Short Hedge



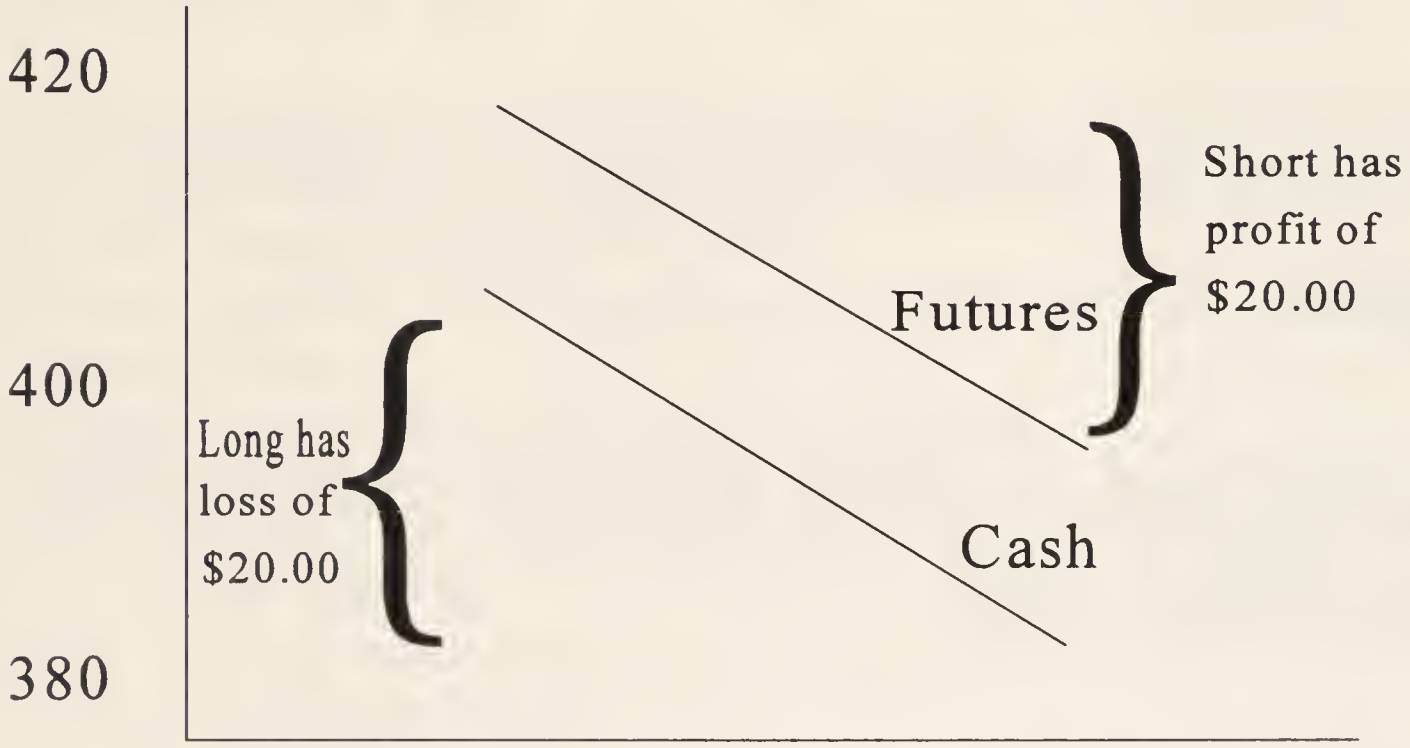
October Cash Price - Short Hedge



Short hedge - Price Increase



Short Hedge - Price Decline



Chapter Summary

- Futures markets evolved over time.
- Cash and futures prices tend to converge.
- Losses in whole or in part, offset by gains.
- Long cash ⇨ hold physical commodity for future sale.
- Short cash ⇨ expecting to buy the commodity.
- Hedge: take an opposite futures position.
- Futures contract fixes the price.

Futures Market Quiz

1. ***The interaction of buyers and sellers in the futures market help to discover _____ and to provide for a _____ marketplace.***
   a) competition, noisy;
   b) price, liquid;
   c) futures, central, or
   d) standardization, new.

2. ***Futures markets evolved from cash markets to cash forward markets out of _____.***
   a) chaos caused by the Roman Empire;
   b) chaos caused by erratic supply, poor storage facilities and large price swings, or
   c) desperation by men who wanted to fix prices.

3. ***Futures markets are traded on the floor of the exchange where price is determined by:***
   a) the Clearing Association;
   b) auction and open outcry;
   c) ticker tape, or
   d) exchange observers.

4. ***Margin money in futures markets is referred to as:***
   a) good faith, earnest money;
   b) profit;
   c) space on a page, or
   d) the broker's fee.

Hedge Exercises - Short Hedge

Barley

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. futures	Expected Price $120.00/mt	$145.00/mt
NOVEMBER 1: Sell (Short) Cash _____ Dec. Futures	Actual Sale Price _____	$115.00 /mt
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Barley Short Hedge

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $120.00/mt	$145.00/mt
NOVEMBER 1: Sell (Short) Cash **Buy** Dec. Futures	Actual Sale Price $90.00/mt	$115.00 /mt
Profit (Loss)	($30.00/mt)	+$30.00/mt
Gain on **futures** offsets Loss on the **cash** Price		

Hedge Exercises - Short Hedge

Corn

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $3.50/bu	$3.85/bu
NOVEMBER 1: Sell (Short) Cash _____ Dec. Futures	Actual Sale Price _____	$2.85/bu
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Corn Short Hedge

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $3.50/bu	$3.85/bu
NOVEMBER 1: Sell (Short) Cash **Buy** Dec. Futures	Actual Sale Price $2.50/bu	$2.85/bu
Profit (Loss)	($1.00/bu)	+$1.00/bu
Gain on **futures** offsets Loss on the **cash** Price		

Hedge Exercises - Short Hedge

Hogs

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $150.00/ckg	$160.00/ckg
NOVEMBER 1: Sell (Short) Cash _____ Dec. Futures	Actual Sale Price $120.00/ckg	_____
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Hogs Short Hedge

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $150.00/ckg	$160.00/ckg
NOVEMBER 1: Sell (Short) Cash **Buy** Dec. Futures	Actual Sale Price $120.00/ckg	$130.00/ckg
Profit (Loss)	($30.00/ckg)	+30.00/ckg
Gain on **futures** offsets Loss on the **cash** Price		

Hedge Exercises - Short Hedge

Canola

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Nov Futures	Expected Price $353.00/mt	$360.00/mt
NOVEMBER 1: Sell (Short) Cash _____ Nov Futures	Actual Sale Price _____	$385.00 /mt
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Canola Short Hedge

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Nov. Futures	Expected Price $353.00/mt	$360.00/mt
NOVEMBER 1: Sell (Short) Cash **Buy** Nov. Futures	Actual Sale Price $378.00/mt	$385.00 /mt
Profit (Loss)	+$25.00/mt	($25.00/mt)
Gain on **cash** offsets Loss on the **futures** Price		

Hedge Exercises - Short Hedge

Slaughter Cattle

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $88.00/cwt	$96.00/cwt
NOVEMBER 1: Sell (Short) Cash _____ Dec. Futures	Actual Sale Price _____	_____
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Cattle Short Hedge

TRANSACTION	NOV. CASH (Physical)	FUTURES
APRIL 15: Long Cash Sell (Short) Dec. Futures	Expected Price $88.00/cwt	$96.00/cwt
NOVEMBER 1: Sell (Short) Cash **Buy** Dec. Futures	Actual Sale Price $95.00/cwt	$103.00/cwt
Profit (Loss)	$7.00/cwt	($7.00/cwt)
Gain on **cash** offsets Loss on the **futures** Price		

Local Hedge Exercise - Short Hedge

Commodity _____

TRANSACTION	_____ CASH (Physical)	_____ Futures
Date _____: Long Cash Sell (Short) _____ Futures	Expected Price	
Date _____: Sell (Short) Cash _____ Futures	Actual Sale Price	
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Local Hedge Exercise - Short Hedge

Commodity _____

TRANSACTION	_____ CASH (Physical)	_____ Futures
Date _____: Long Cash Sell (Short) _____ Futures	Expected Price	
Date _____: Sell (Short) Cash _____ Futures	Actual Sale Price	
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Hedge Exercises - Long Hedge

Barley

TRANSACTION	NOV. CASH (Physical)	JULY FUTURES
APRIL 15: Short Cash Buy (Long) July Futures	Expected Price _____	$125.00/mt
May 20: Buy (Long) Cash _____ July Futures	Actual Purchase Price _____	$155.00/mt
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Barley Long Hedge

TRANSACTION	NOV. CASH (Physical)	JULY FUTURES
APRIL 15: Short Cash Buy (Long) July Futures	Expected Price $100.00/mt	$125.00/mt
May 20: Buy (Long) Cash **Sell** July Futures	Actual Purchase Price $130.00/mt	$155.00/mt
Profit (Loss)	($30.00)	+$30.00
Gain on **futures** offsets Loss on the **cash** Price		

Hedge Exercises - Long Hedge

CORN

TRANSACTION	NOV. CASH (Physical)	JULY FUTURES
APRIL 15: Short Cash Buy (Long) July Futures	Expected Price $3.00/bu	$3.25/bu
May 20: Buy (Long) Cash ____ July Futures	Actual Purchase Price _____	$4.15/bu
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Answer: Corn Long Hedge

TRANSACTION	NOV. CASH (Physical)	JULY FUTURES
APRIL 15: Short Cash Buy (Long) July Futures	Expected Price $3.00/bu	$3.25/bu
May 20: Buy (Long) Cash **Sell** July Futures	Actual Purchase Price $3.90/bu	$4.15/bu
Profit (Loss)	($0.90/bu)	+$0.90/bu
Gain on **futures** offsets Loss on the **cash** Price		

Local Hedge Exercise - Long Hedge

Commodity _____

TRANSACTION	_____CASH (Physical)	_____ FUTURES
Date _____: Short Cash Buy (Long) _____ Futures	Expected Price _____	
Date _____: Buy (Long) Cash _____ Futures	Actual Purchase Price _____	
Profit (Loss)	_____	_____
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Local Hedge Exercise - Long Hedge

Commodity _____

TRANSACTION	_____CASH (Physical)	_____FUTURES
Date _____: Short Cash Buy (Long) _____ Futures	Expected Price _____	
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Local Hedge Exercise - Long Hedge

Commodity _____

TRANSACTION	_____CASH (Physical)	_____ FUTURES
Date _____: Short Cash Buy (Long) _____ Futures	Expected Price _____	
Date _____: Buy (Long) Cash _____ Futures	Actual Purchase Price _____	
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

Local Hedge Exercise - Long Hedge

Commodity _____

TRANSACTION	_____CASH (Physical)	_____ FUTURES
Date _____: Short Cash Buy (Long) _____ Futures	Expected Price _____	
Date _____: Buy (Long) Cash _____ Futures	Actual Purchase Price _____	
Profit (Loss)	_____	_____
Gain on _____ offsets Loss on the _____ Price		

BASIS

Overview

In this chapter, the concept of basis and its importance is explained. Basis localizes the futures price and is primarily a function of carrying charges, transfer costs and exchange rates. Basis has a different economic meaning for seasonally produced, storable commodities such as grain and oilseeds compared to nonstorable (continuously produced) commodities such as livestock.

Many grain producers focus on elevator handling charges which are a fixed part of the basis. It is the variable components of basis that change and which provide the market signals. It is these components that are the focus of this section and have the most relevance to the hedger. The difference between adjusted and unadjusted basis is covered and the fact that the unadjusted basis distorts these markets signals is explained.

Objectives

After completing this Chapter, the participant will:

1. Understand the definition of basis.
2. Understand why basis is different for grains and oilseeds versus livestock.
3. Understand the difference between "unadjusted basis" and "adjusted basis."
4. Understand the importance of basis as a measure of the relationship between cash and futures prices.

Suggestions to Facilitators

Start by defining basis in its simplest form as the difference between the local cash price and a futures price. Use the example from the manual and then move to a local example of cash grain prices and the nearby futures.

Point out that basis also exists for U.S. farmers and that it is often varies as much in the U.S. as it does in Canada. **Stress that it is important to understand basis patterns in order to learn how to manage basis risk.**

Eliminate the potential for producers to dwell on handling charges by introducing them as a fixed cost component. The variable components are the key to basis changes and fluctuations and what needs to be studied.

Explain that basis is different for storable and nonstorable commodities. Use the hog example and the basis charts for hogs in the manual to explain the basis for livestock.

Define carrying charge and use the examples as indicated in the background material in the participant's manual. A useful exercise is to change the price levels and keep interest rates constant and then keep price levels constant and change interest rates. This will allow participants to visualize the change in basis levels and futures spreads as prices and interest rates change.

Discuss the difference between a positive and a negative basis. **Stress the fact that these impacts will be felt regardless if a producer uses risk management or not.** Explain how the threat of delivery affects the basis and causes the futures and cash to move together.

It is important for the producers to understand that a change in the basis will affect the results of their hedge. Work through the examples of a widening and a narrowing of the basis. Make sure that they understand the difference impacts in terms of a short and a long hedge (Overhead 15).

Once they understand the concept of a change in the basis the next step is for them to construct a basis chart. We have included an exercise in calculating the basis at the end of the chapter.

Once a hedge is placed price risk is gone but, the basis over the life of the hedge may still change. Basis risk is typically much smaller than price risk as it fluctuates much less than the price. **Stress to the participants that basis risk occurs, even if you do not hedge**. Basis risk can be hedged, using basis contracts, or deferred delivery contracts, where available. Both contracts will be discussed further in Chapter 7.

The last item in this chapter is adjusted and unadjusted basis. Explain the difference between adjusted and unadjusted basis. **Stress the fact that unadjusted basis should not be used to determine market signals in the absences of currency rate fluctuations.** The impact that a change in the exchange rate has on Canadian prices for commodities hedged on a U.S. futures exchange is covered in Chapter 6.

Terminology to Define in this section

- Basis
- Carrying Charges (Costs)
- Inverted markets
- Transfer Costs
- Negative Basis
- Positive Basis
- Adjusted basis
- Unadjusted basis

List of Overheads

Visual aids for this chapter include:

Overhead # **Title**

1. Chapter Objectives.
2. Basis Defined.
3. Livestock Basis Calculation.
4. Hog Basis.
5. Carrying Charge Market.
6. Inverted Markets.
7. Basis - Surplus Area.
8. Basis -Deficit Area.
9. Negative Basis.
10. Positive Basis.
11. Basis Widens.
12. Basis Widens - Short Hedge.
13. Basis Narrows.
14. Basis Narrows - Short Hedge.
15. Impact of Basis Change on Overall Hedge.
16. Live Cattle Basis Calculation Alberta.
17. Live Cattle Basis (Graph) - 1997.
18. Unadjusted & Adjusted Basis.
19. Chapter Summary - (I).
20. Chapter Summary - (II).
21. Basis Questions.
22. Live Cattle Basis Calculation - Ontario.

Basis Questions - *Answer Sheet*

1 Adjusted basis is:

a) current basis corrected for historic trends;
b) basis in Canada calculated after converting Canadian cash prices to U.S. equivalents;
c) basis in Canada calculated after converting U.S. futures prices to Canadian funds, or
d) none of the above.

2. When local basis for a commodity is expressed in a common currency and is negative:

a) it is said to be "under";
b) it likely means the local area is surplus the product;
c) it means futures are higher than cash, or
d) all of the above.

3. If live cattle futures are at $75 U.S./cwt, the cash price in Southern Alberta is $95 Cdn/cwt and the Canadian dollar is trading at $0.74 U.S., the adjusted basis in Southern Alberta is:

a) $10.00 over;
b) $10.00 under;
c) $6.35 under; - ($75 U.S. futures ÷ $0.74 U.S. exchange rate = $101.35 Cdn
$101.35 Cdn - $95 Cdn cash price = adjusted basis of $6.35 under)
d) Indeterminate, or
e) $5.42 over.

4. A canola producer in Eastern Saskatchewan sells November canola futures at $425.00 Cdn/mt. The producer expects the local basis to be $15.00 Cdn/mt under in October, when the hedge is completed. What price does the producer expect to receive with this hedge?

- $410.00 Cdn/mt ($425.00 futures less $15 "under" basis = $410.00)

Live Cattle Basis Calculation - Ontario (1997)

Week Ending	Ontario Cash ($Cdn/cwt)	Futures Price ($Cdn/cwt)	Ontario Basis ($Cdn/cwt)
3-Jan-97	87.88	89.17	-1.29
10-Jan-97	86.46	87.97	____
17-Jan-97	85.00	88.35	____
24-Jan-97	83.84	87.62	____
31-Jan-97	83.93	86.80	____
7-Feb-97	81.86	88.38	____
14-Feb-97	81.84	89.14	____
21-Feb-97	84.91	92.56	____
28-Feb-97	86.94	95.39	____
7-Mar-97	88.27	94.02	____
14-Mar-97	87.73	93.47	____
21-Mar-97	87.23	____	-6.84
28-Mar-97	87.77	____	-6.14
4-Apr-97	89.13	____	-1.30
11-Apr-97	87.94	____	-1.39
18-Apr-97	90.28	____	-0.10
25-Apr-97	90.13	____	0.32
2-May-97	89.26	____	-0.96
9-May-97	91.27	____	0.89
16-May-97	91.20	____	0.49
23-May-97	____	89.69	0.11
30-May-97	____	90.09	-0.29
6-Jun-97	____	88.15	0.43
13-Jun-97	____	88.17	-1.54
20-Jun-97	____	89.00	0.99
27-Jun-97	89.73	88.62	____
4-Jul-97	88.44	88.50	____
11-Jul-97	88.85	88.15	____
18-Jul-97	89.28	90.69	____
25-Jul-97	90.88	92.15	____
1-Aug-97	92.73	94.35	____
8-Aug-97	93.32	96.84	-3.52
15-Aug-97	91.05	97.25	-6.20
22-Aug-97	90.22	95.83	-5.61
29-Aug-97	89.74	94.88	-5.14
5-Sep-97	88.94	93.40	-4.46
12-Sep-97	88.21	95.85	-7.64
19-Sep-97	87.71	94.94	-7.23
26-Sep-97	86.89	94.34	-7.45
3-Oct-97	85.82	91.57	-5.75
10-Oct-97	83.36	91.53	-8.17
17-Oct-97	85.13	92.14	-7.01
24-Oct-97	86.18	93.19	-7.01
31-Oct-97	86.73	94.55	-7.82
7-Nov-97	85.98	94.07	-8.09
14-Nov-97	86.88	94.07	-7.19
21-Nov-97	86.90	95.39	____
28-Nov-97	87.39	95.78	____
5-Dec-97	87.90	96.52	____
12-Dec-97	87.97	95.63	____
19-Dec-97	88.82	94.00	____
26-Dec-97	90.62	94.49	-3.87

Overheads For This Section

Chapter Objectives

- Define basis
- Explain grains & oilseeds basis versus livestock basis
- Differentiate between "unadjusted basis" and "adjusted basis"
- Explain the relationship between cash and futures prices

Basis Defined

- Local Cash Price minus futures price

- Basis = $30.00 **over** futures

Cash Price	$350.00
Futures Price	$320.00
Basis	+ 30.00

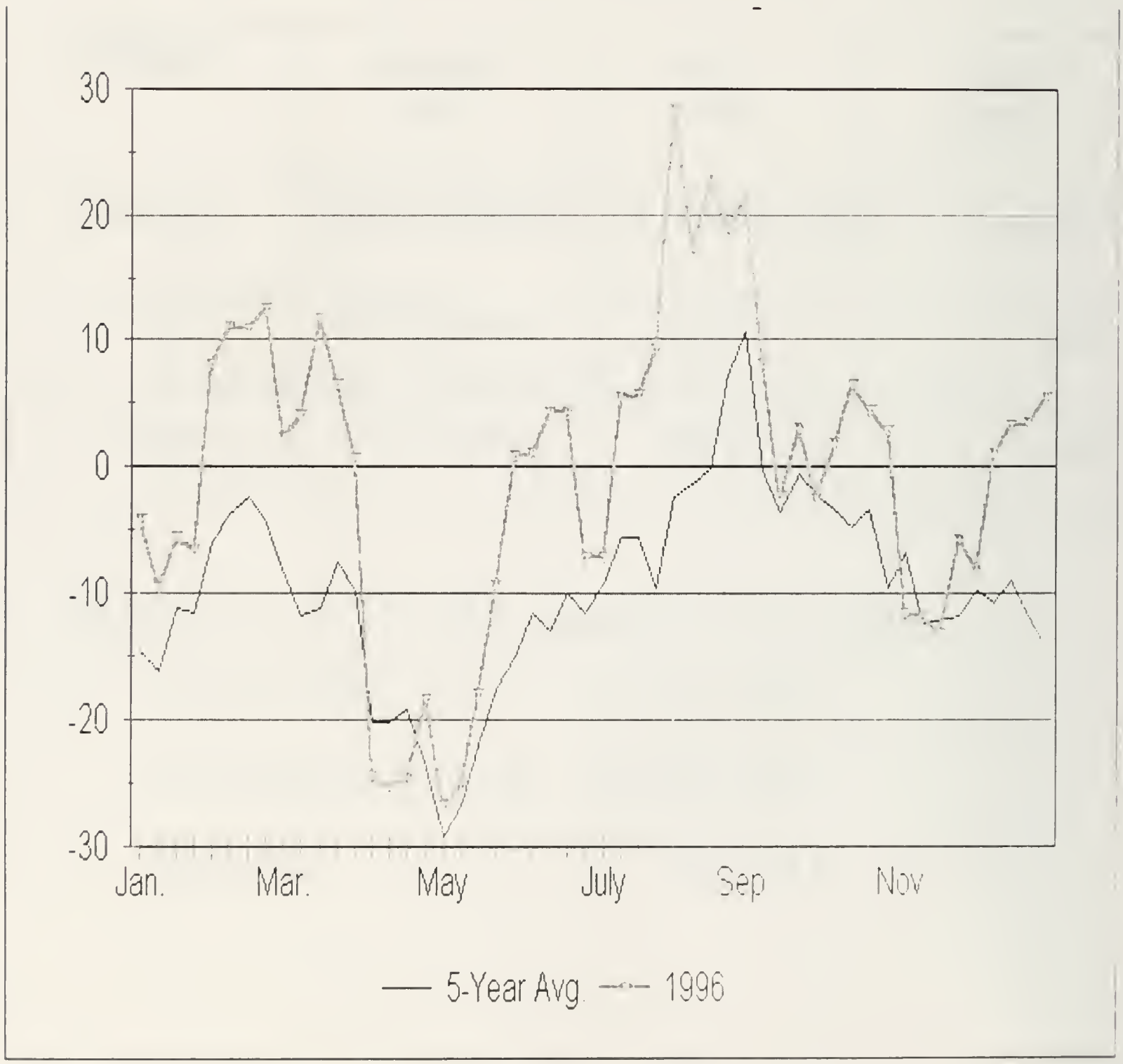
- Basis = $30.00 **under** futures

Cash Price	$210.00
Futures Price	$240.00
Basis	- 30.00

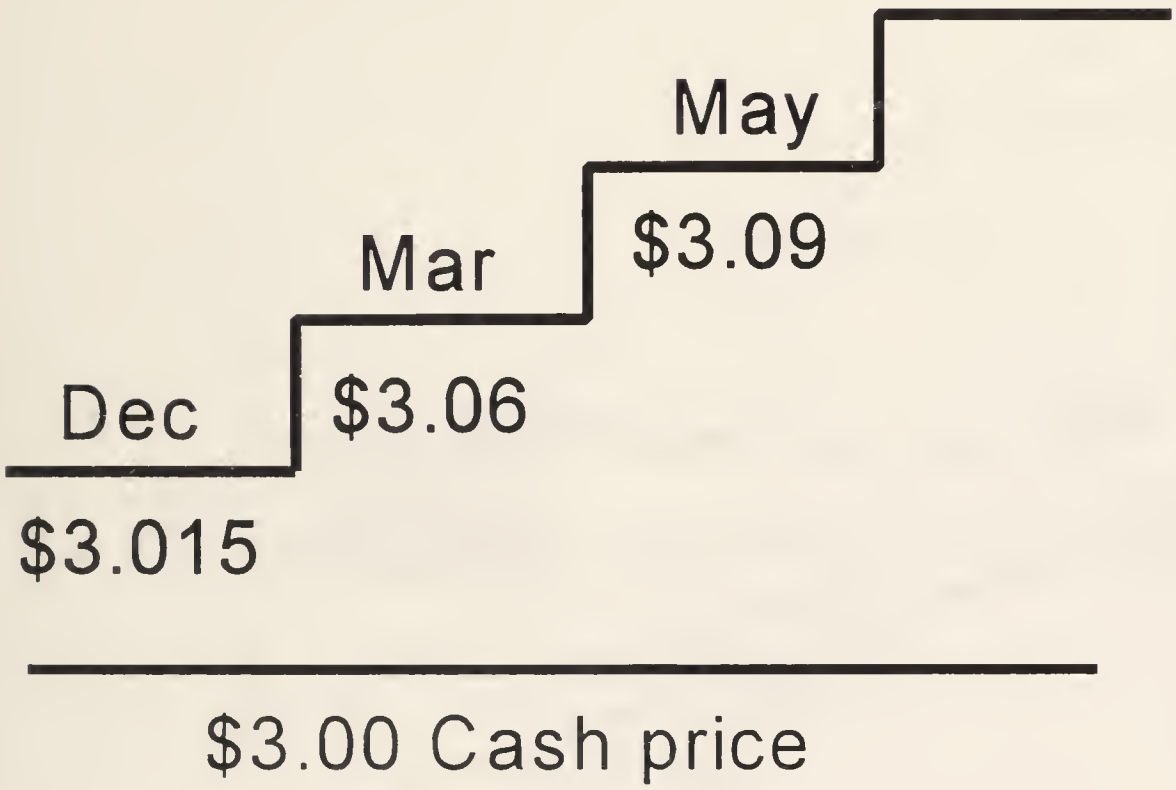
Livestock Basis Calculation
(US $ / cwt)

Expiry Month	Cash Price	Futures Price	Basis
February	$75.00	**minus** $78.00	= -$3.00
April	$75.00	**minus** $73.00	= +$2.00
June	$75.00	**minus** $80.00	= -$5.00

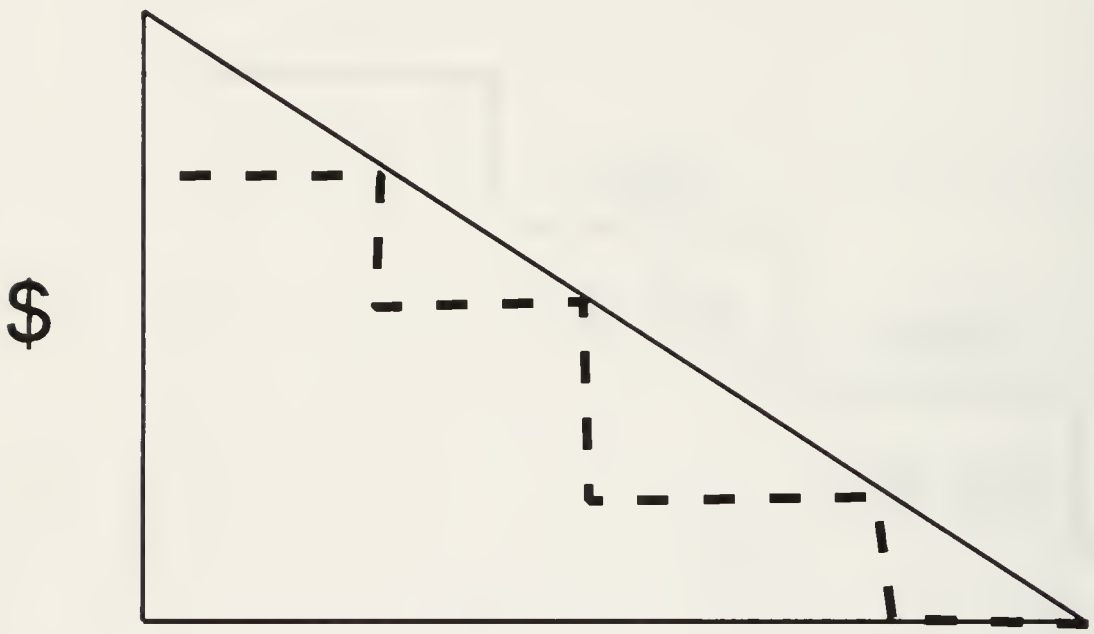
Hog Basis
1996 and 5-Year Average



Carrying Charge Market

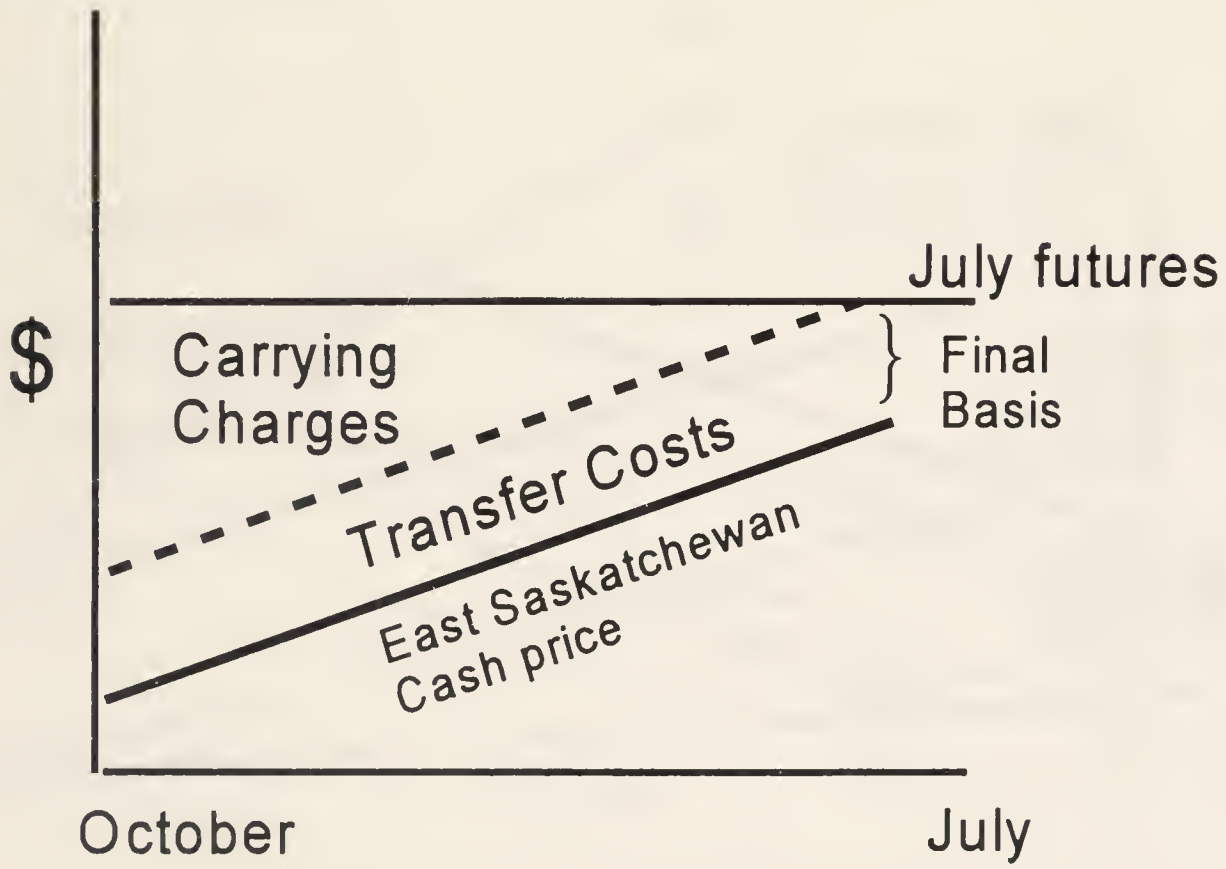


Inverted Markets

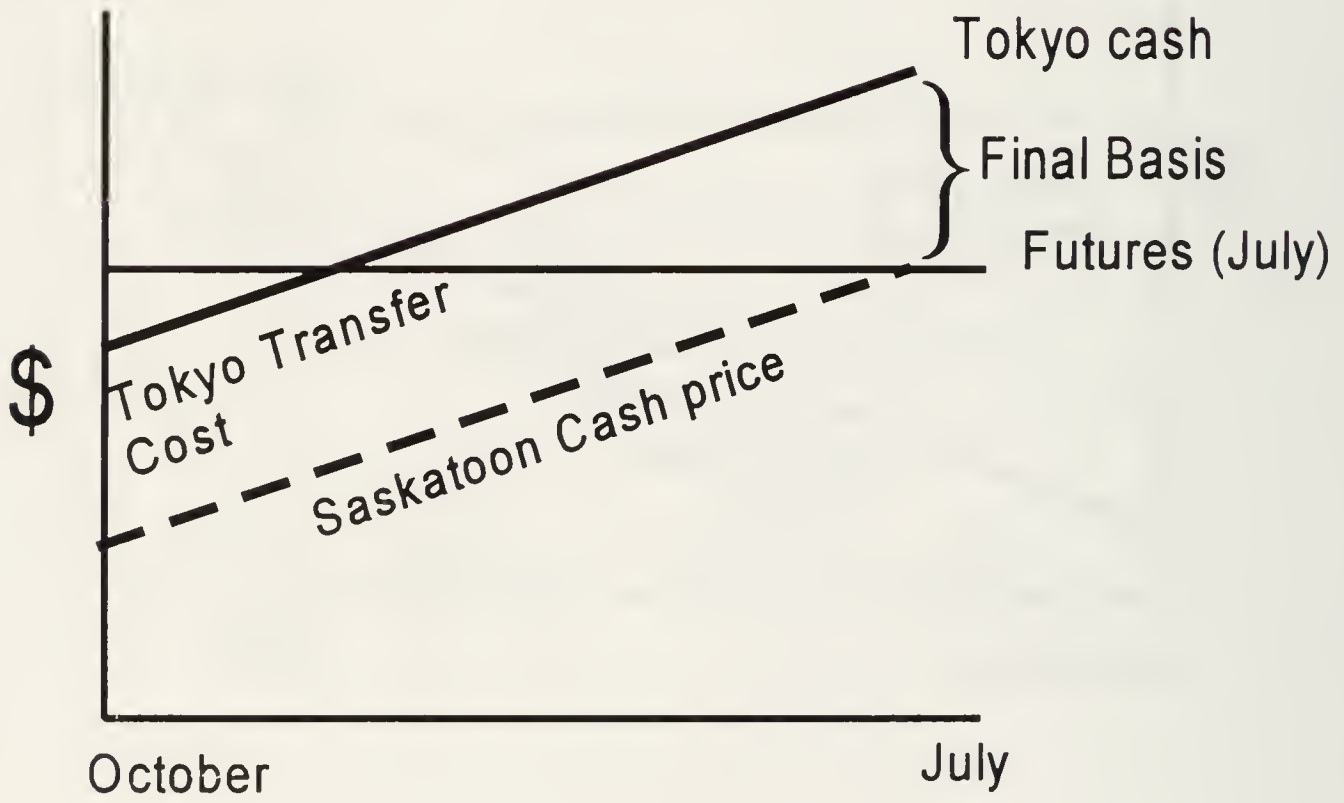


JAN	MAR	MAY	JUL
$300.00	$295.00	$290.00	$286.00

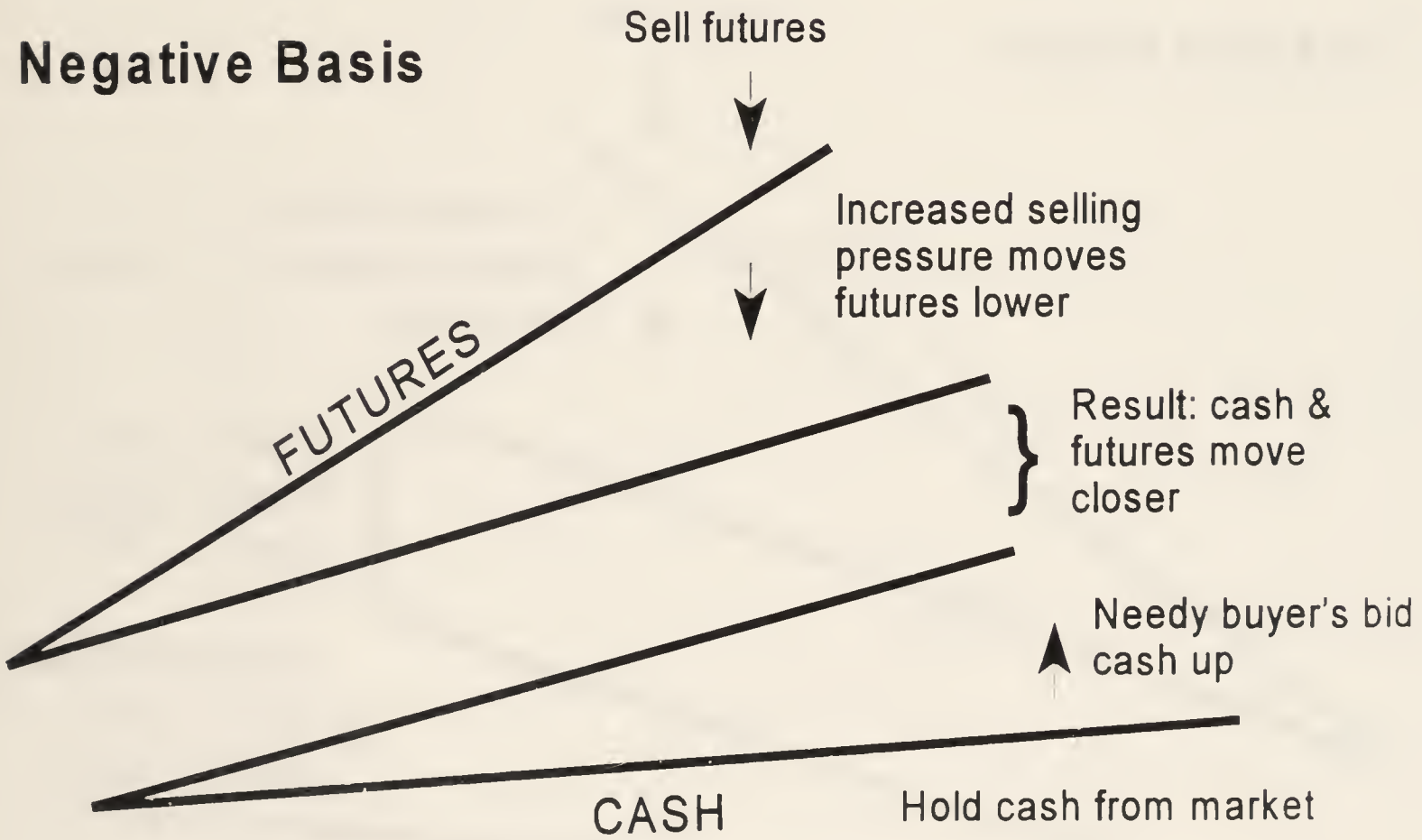
Basis - Surplus Area



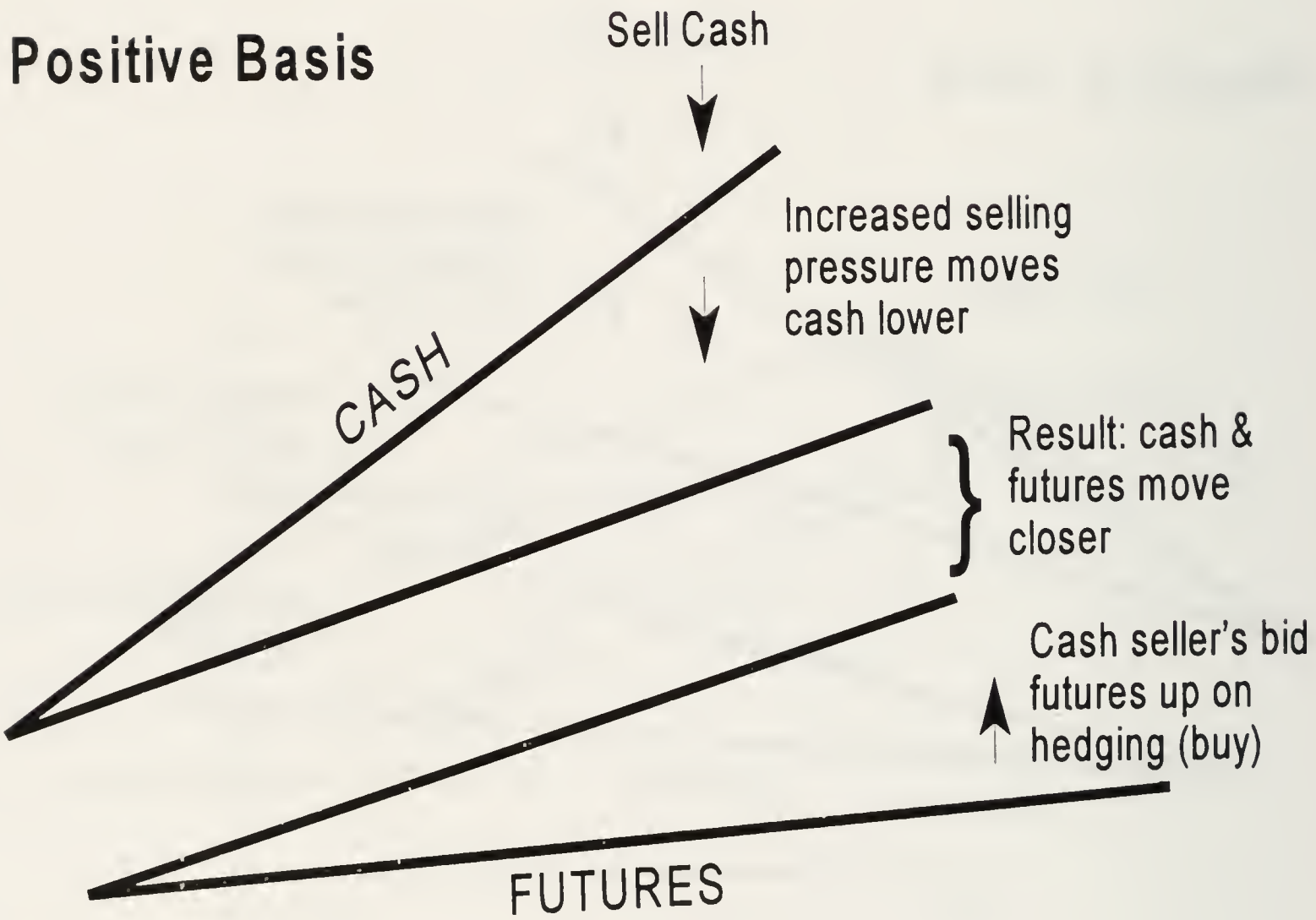
Basis - Deficit Area



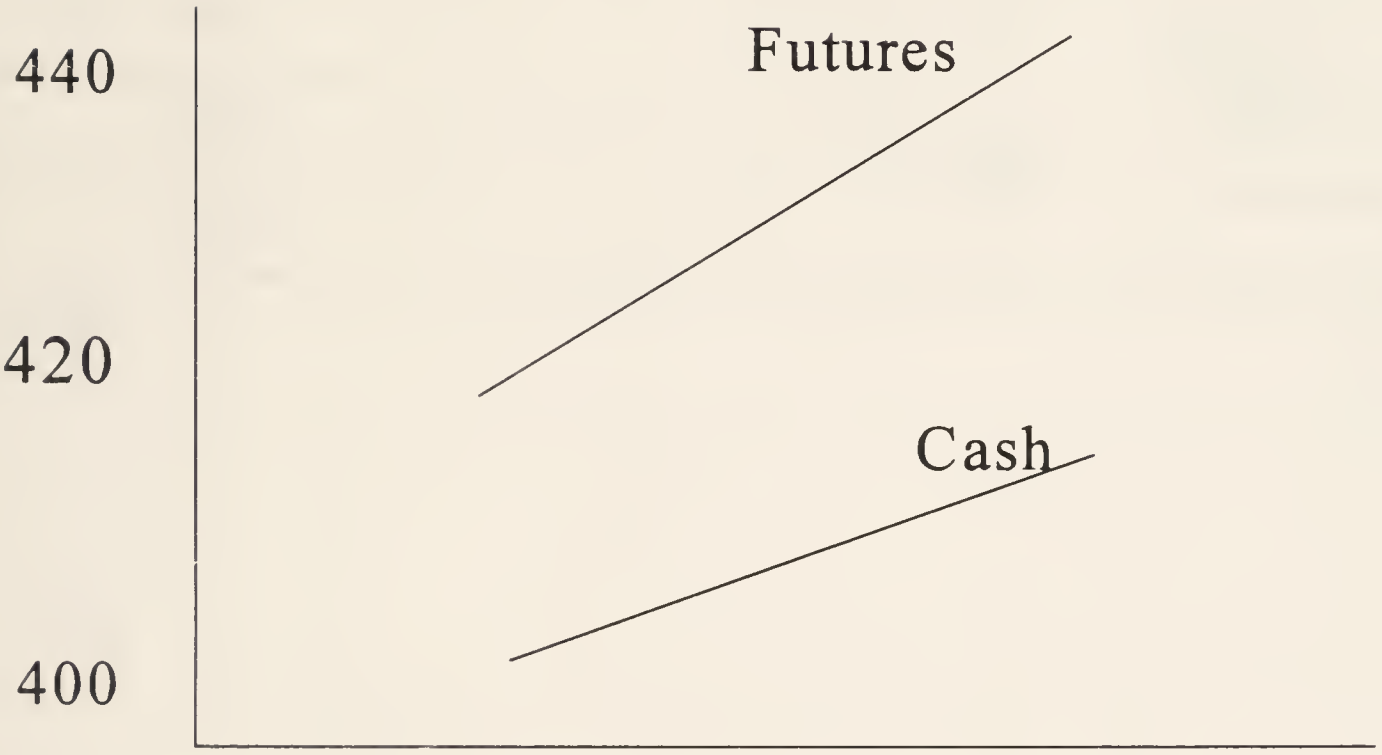
Negative Basis



Positive Basis



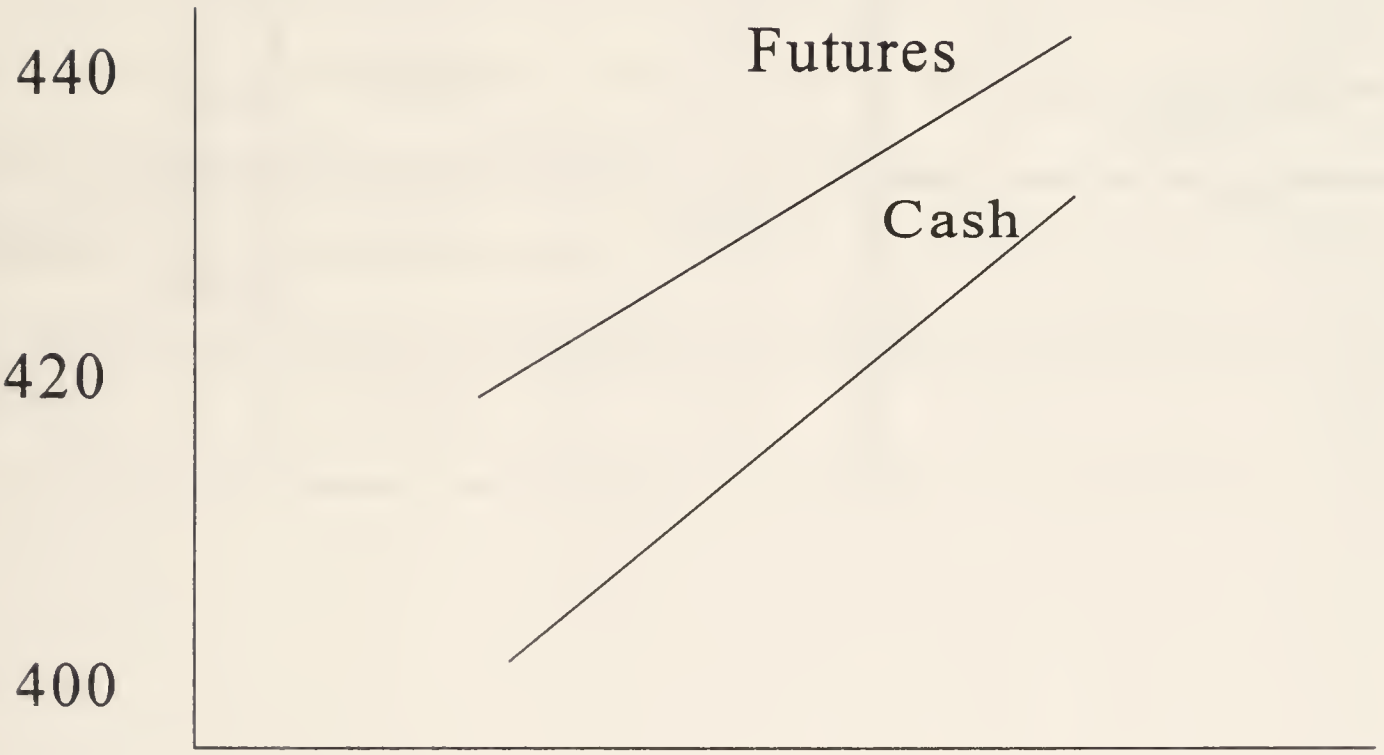
Basis Widens



Basis Widens - Short Hedge

		Cash	Futures
Feb:	Position	long	short
	Price	$400	$420
Oct:	Position	_____	long
	Price	_____	$440
NET		_____	($20)

Basis Narrows



Basis Narrows - Short Hedge

		Cash	Futures
Feb:	Position	long	short
	Price	$400	$420
Oct:	Position	_____	long
	Price	_____	$440
NET		_____	($20)

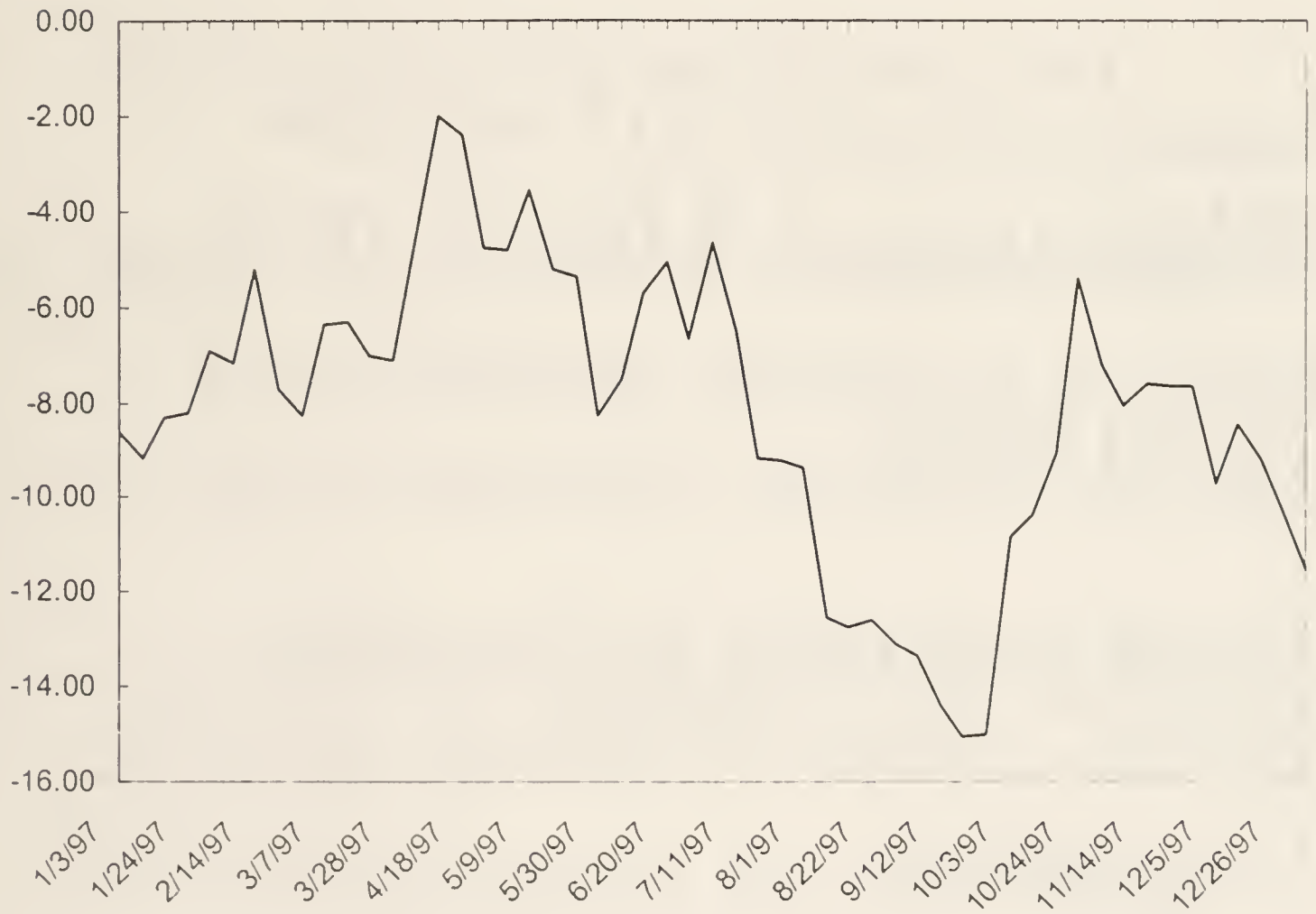
Impact of Basis Change on Overall Hedge

Expected Basis	Short Hedge		Long Hedge	
	Basis Widens	Basis Narrows	Basis Widens	Basis Narrows
Negative	Loss	Profit	Profit	Loss
Positive	Profit	Loss	Loss	Profit

Live Cattle Basis Calculation - Alberta (1997)

Week Ending	Alberta Cash ($Cdn/cwt)	Futures Price ($Cdn/cwt)	Alberta Basis ($Cdn/cwt)
3-Jan-97	80.56	89.17	-8.61
10-Jan-97	78.78	87.97	-9.19
17-Jan-97	80.02	88.35	-8.33
24-Jan-97	79.39	87.62	-8.23
31-Jan-97	79.90	86.80	-6.90
7-Feb-97	81.22	88.38	-7.16
14-Feb-97	83.94	89.14	-5.20
21-Feb-97	84.82	92.56	-7.74
28-Feb-97	87.12	95.39	-8.27
7-Mar-97	87.65	94.02	-6.37
14-Mar-97	87.13	93.47	-6.34
21-Mar-97	87.05	94.07	-7.02
28-Mar-97	86.79	93.91	-7.12
4-Apr-97	86.03	90.43	-4.40
11-Apr-97	87.33	89.33	-2.00
18-Apr-97	87.96	90.38	-2.42
25-Apr-97	85.03	89.81	-4.78
2-May-97	85.41	90.22	-4.81
9-May-97	86.82	90.38	-3.56
16-May-97	85.48	90.71	-5.23
23-May-97	84.31	89.69	-5.38
30-May-97	81.83	90.09	-8.26
6-Jun-97	80.63	88.15	-7.52
13-Jun-97	82.47	88.17	-5.70
20-Jun-97	83.92	89.00	-5.08
27-Jun-97	81.95	88.62	-6.67
4-Jul-97	83.82	88.50	-4.68
11-Jul-97	81.62	88.15	-6.53
18-Jul-97	81.53	90.69	-9.16
25-Jul-97	82.91	92.15	-9.24
1-Aug-97	84.98	94.35	-9.37
8-Aug-97	84.30	96.84	-12.54
15-Aug-97	84.51	97.25	-12.74
22-Aug-97	83.25	95.83	-12.58
29-Aug-97	81.81	94.88	-13.07
5-Sep-97	80.08	93.40	-13.32
12-Sep-97	81.43	95.85	-14.42
19-Sep-97	79.87	94.94	-15.07
26-Sep-97	79.32	94.34	-15.02
3-Oct-97	80.76	91.57	-10.81
10-Oct-97	81.16	91.53	-10.37
17-Oct-97	83.05	92.14	-9.09
24-Oct-97	87.75	93.19	-5.44
31-Oct-97	87.32	94.55	-7.23
7-Nov-97	85.98	94.07	-8.09
14-Nov-97	86.47	94.07	-7.60
21-Nov-97	87.73	95.39	-7.66
28-Nov-97	88.13	95.78	-7.65
5-Dec-97	86.81	96.52	-9.71
12-Dec-97	87.15	95.63	-8.48
19-Dec-97	84.77	94.00	-9.23
26-Dec-97	84.21	94.49	-10.28

Alberta Live Cattle Basis - 1997



Unadjusted & Adjusted Basis

Unadjusted Basis:

- Local cash price in Canadian dollars minus US futures price

Adjusted Basis:

- Local cash price in Canadian dollars minus US futures price in Cdn dollars

Chapter Summary

- Cash and futures move together
- Seldom by the same amount
- Basis for storable commodities:
  ⇨ basis widens, incentive to store
  ⇨ basis narrows, incentive to sell
- Cash prices related to the delivery point price:
  ⇨ transportation and handling costs

Chapter Summary

- Unique local basis patterns:
  ⇨ local supply and demand
- No storage cost for livestock
- Adjusted basis uses common currency unit
- Cannot hedge in futures market

Basis Questions

1. ***Adjusted basis is:***
   a) current basis corrected for historic trends
   b) basis in Canada calculated after converting Canadian cash prices to US equivalents
   c) basis in Canada calculated after converting US futures prices to Canadian funds, or
   d) none of the above

2. ***When local basis for a commodity is expressed in a common currency and is negative:***
   a) it is said to be "under"
   b) it likely means the local area is surplus the product
   c) it means futures are higher than cash, or
   d) all of the above

3. ***If live cattle futures are at $75 US/cwt, the cash price in Southern Alberta is $95 Cdn/cwt and the Canadian dollar is trading at $0.74 US, the adjusted basis in Southern Alberta is:***
   a) $10.00 over
   b) $10.00 under
   c) $6.35 under
   d) Indeterminate, or
   e) $5.42 over

4. ***A canola producer in Eastern Saskatchewan sells November canola futures at $425.00 Cdn/mt. The producer expects the local basis to be $15.00 Cdn/mt under in October, when the hedge is completed. What price does the producer expect to receive with this hedge?***

Live Cattle Basis Calculation - Ontario (1997)

Week Ending	Ontario Cash ($Cdn/cwt)	Futures Price ($Cdn/cwt)	Ontario Basis ($Cdn/cwt)
3-Jan-97	87.88	89.17	-1.29
10-Jan-97	86.46	87.97	____
17-Jan-97	85.00	88.35	____
24-Jan-97	83.84	87.62	____
31-Jan-97	83.93	86.80	____
7-Feb-97	81.86	88.38	____
14-Feb-97	81.84	89.14	____
21-Feb-97	84.91	92.56	____
28-Feb-97	86.94	95.39	____
7-Mar-97	88.27	94.02	____
14-Mar-97	87.73	93.47	____
21-Mar-97	87.23	____	-6.84
28-Mar-97	87.77	____	-6.14
4-Apr-97	89.13	____	-1.3
11-Apr-97	87.94	____	-1.39
18-Apr-97	90.28	____	-0.1
25-Apr-97	90.13	____	0.32
2-May-97	89.26	____	-0.96
9-May-97	91.27	____	0.89
16-May-97	91.20	____	0.49
23-May-97	____	89.69	0.11
30-May-97	____	90.09	-0.29
6-Jun-97	____	88.15	0.43
13-Jun-97	____	88.17	-1.54
20-Jun-97	____	89.00	0.99
27-Jun-97	89.73	88.62	____
4-Jul-97	88.44	88.50	____
11-Jul-97	88.85	88.15	____
18-Jul-97	89.28	90.69	____
25-Jul-97	90.88	92.15	____
1-Aug-97	92.73	94.35	____
8-Aug-97	93.32	96.84	-3.52
15-Aug-97	91.05	97.25	-6.2
22-Aug-97	90.22	95.83	-5.61
29-Aug-97	89.74	94.88	-5.14
5-Sep-97	88.94	93.40	-4.46
12-Sep-97	88.21	95.85	-7.64
19-Sep-97	87.71	94.94	-7.23
26-Sep-97	86.89	94.34	-7.45
3-Oct-97	85.82	91.57	-5.75
10-Oct-97	83.36	91.53	-8.17
17-Oct-97	85.13	92.14	-7.01
24-Oct-97	86.18	93.19	-7.01
31-Oct-97	86.73	94.55	-7.82
7-Nov-97	85.98	94.07	-8.09
14-Nov-97	86.88	94.07	-7.19
21-Nov-97	86.90	95.39	____
28-Nov-97	87.39	95.78	____
5-Dec-97	87.90	96.52	____
12-Dec-97	87.97	95.63	____
19-Dec-97	88.82	94.00	____
26-Dec-97	90.62	94.49	-3.87

OPTIONS

Overview

This chapter is designed to explain what options are and how to use them in risk management. Thus, most of the definitions and the examples will be from the perspective of the buyer of the option. Buying an option is analogous to buying insurance. Selling or "writing" options can be used to manage risk, but can introduce risk and should not be included in an Introductory course.

Objectives

Upon completion of this Chapter, the participants will:

1. Understand what an option is and how it works.
2. Understand what factors influence the premium.
3. Understand the notion of time decay.
4. How to hedge with options.

Suggestions to Facilitators

To define the "rights" or "choice" associated with an option, it is best to begin with a land example. Options on real estate are very common, and in many instances have been used in the farming community. Once you have explained the land example the major components of an option can be identified. Options on futures have exactly the same components.

Once you have explained the components of an option on futures you should then explain the rights and obligations of the buyer and the seller (writer) of the option. **Stress the fact that the buyer has the right but not the obligation to exercise the option**. The seller on the other hand does have an obligation should the option be exercised.

Option premiums are comprised of two components **intrinsic value** and **time value**. The exercise included for calculating intrinsic and time value is not only useful for illustrating these terms but, it will also help participants understand how options work. Another feature of options which should be covered is the concept of **time decay**.

You should cover the 3 classifications of options in-the money, out-of-the-money and at-the money for both puts and calls. Work through the examples for each classification.

The section on closing out an option position helps to demonstrate the risk to the seller and the need for the option seller to pay margins.

The insurance value provided by an option should be illustrated. Explain how a put option can be used to establish a **floor price** while a call option can be used to establish a **ceiling price**. The section on how options works describes the main advantage of options over futures. It provides a good stepping stone to the next chapter on hedging.

Terminology to Define in this section

- Option
- PUTS
- CALLS
- Strike price
- Premium
- Expiry dates
- Intrinsic value
- Time value
- Volatility
- Time decay
- In-the-money
- At-the-money
- Out-of-the-money
- Exercising an option - assignment
- Automatic Exercise
- Floor price
- Ceiling price

List of Overheads

Visual aids for this chapter include:

Overhead # **Title**

1. Chapter Objectives.
2. What is an Option?
3. Answers To Land Example Questions (2).
5. Option Components.
6. Call Option.
7. Call Option - Example.
8. Put Option.
9. Put Option - Example.
10. Options Rights and Obligations - Buyer.
11. Options Rights and Obligations - Seller.
12. Option Premium Value.
13. Intrinsic Value.
14. Time Value.
15. Premium Values Put Option.
16. Premium Values Call Option.
17. Calculating Time Value and Intrinsic Value.
18. Time Decay of Options
19. Options Classifications.
20. In-the-Money Options.
21. In-the-Money Options - Examples.
22. Out-of-the-Money Options.
23. Out-of-the-Money Options - Examples.
24. At-the-Money Options.
25. At-the-Money Options - Examples

26. Options Classifications Exercise.
27. Time Decay At or Out-of-the-Money.
28. Time Decay In-the-Money.
29. Closing an Option Position.
30. When Option Exercised.
31. Option Offset.
32. Let Option Expire.
33. How Options Work.
34. Advantage of Options - Seller.
35. Calculating Expected Price - Put Option.
36. Ceiling Price - Call Option.
37. Chapter Summary.
38. Option Quiz (3).
41. Options Exercise.
42. Options Exercise - Answer Sheet (3).

Answers to Land Example Questions:

- Who is the holder of the right?
  Real estate broker representing foreign interest

- Who is the issuer or grantor of the right?
  Pension fund

- What is the underlying asset of the option?
  Office building

- At what price will the deal be struck or the right exercised?
  $50 million

- What premium did the buyer or holder of the option pay?
  $100,000

- When does the buyer's right (option) expire?
  May 31

- What happens to the premium money if the option expires without being exercised?
  Seller of the option (pension fund) keeps premium

- What happens to the premium money if the option is exercised by the buyer before or on the expiry date?
  Seller keeps the premium, but must sell the building for $50 million. The premium is not a partial payment.

- What happens to the office building if the option expires without being exercised?
  The ownership stays with the pension fund.

- What happens to the office building if the option is exercised before or on the expiry date?
  The pension fund must sell the building to the real estate broker's clients for $50 million.

- When can buyer exercise their right?
  Anytime up to and including May 31

The above underscored words or terms make up the components of an option. All must be present and included for an option to exist.

CALCULATING TIME VALUE AND INTRINSIC VALUE

ANSWER SHEET

REMEMBER, *time value* plus *intrinsic value* must equal the option premium given.

P = PUT
C = CALL
TIME VALUE = Premium - Intrinsic
INTRINSIC = Strike price versus futures and profitable to exercise (in-the-money)

OPTIONS ON SCOOBIES Scoobie Futures= $188.00			
STRIKE PRICE	PREMIUM	INTRINSIC VALUE	TIME VALUE
200 P	$15.00	*$12.00*	*$3.00*
200 C	$8.00	--	*$8.00*
195 P	$14.00	*$7.00*	*$7.00*
195 C	$10.00	--	*$10.00*
190 P	$12.50	*$2.00*	*$10.50*
190 C	$10.50	--	*$10.50*
185 P	$9.00	--	*$9.00*
185 C	$12.00	*$3.00*	*$9.00*
180 P	$6.00	--	*$6.00*
180 C	$16.00	*$8.00*	*$8.00*

OPTIONS CLASSIFICATION EXERCISE
ANSWER SHEET

CONDITION	CLASSIFICATION
NOV 5.75 C, futures @ $6.00 *(ITM)*	
DEC 2.70 P, futures @ $2.80 *(OTM)*	
NOV 4.00 P, futures @ $3.60 *(ITM)*	
DEC 110 C, futures @ $110 *(ATM)*	
DEC 140 P, futures @ $110 *(ITM)*	
NOV 5.50 C, futures @ $5.62 *(ITM)*	
NOV 4.75 C, futures @ $5.00 *(ITM)*	
DEC 2.60 C, futures @ $2.50 *(OTM)*	
DEC 2.70 P, futures @ $2.70 *(ATM)*	

ITM — in-the-money

OTM — out-of-the-money

ATM — At-the-money

OPTIONS QUIZ

1. *An option premium is:*

   a) determined by the exchange;
   b) set at expiration;
   c) determined when exercised,
   d) negotiated by open outcry.

2. *A CALL option gives the buyer:*

   a) the right, but not the obligation, to sell a futures contract;
   b) the obligation to sell a futures contract;
   c) the right, but not the obligation, to buy a futures contract,
   d) the obligation to buy a futures contract.

3. *A CALL option with a strike price of $95 and the underlying futures at $105 is said to be:*

   a) out-of-the-money;
   b) a bad buy;
   c) at-the-money;
   d) in-the-money,
   e) a good buy.

4. *A PUT option will protect the buyer against:*

   a) a price increase;
   b) a crop failure;
   c) a price decline,
   d) a widening basis.

5. *A CALL option with a strike price of $100 gives the buyer the right, but not the obligation, to:*

   a) buy the underlying futures at $100;
   b) sell the underlying futures at $100;
   c) pay the premium, or
   d) receive the premium.

6. *When a CALL option is exercised, the seller of a CALL:*

   a) receives a short futures position;
   b) receives a long futures position;
   c) receives the premium, or
   d) pays the premium.

7. *You purchased a $90 wheat CALL option. To offset this option you would:*

   a) sell a $90 wheat PUT;
   b) sell a $90 wheat CALL;
   c) buy a $90 wheat PUT;
   d) exercise the option, or
   e) let the option expire.

8. *A wheat CALL with a strike price of $120 was bought for $8.00. The underlying futures are at $130. This option is said to:*

   a) be out-of-the-money by $10;
   b) have intrinsic value of $2;
   c) have intrinsic value of $10,
   d) be at the buyer's breakeven.

9. *An option strike price is equal to the futures price of the underlying contract. The option is:*

   a) out-of-the-money;
   b) at-the-money;
   c) in-the-money, or
   d) deep in-the-money.

10. *A PUT option with a strike price of $400 while the underlying futures are at $370 has a premium of $36. The premium is made up of:*

    a) all time value;
    b) all intrinsic value;
    c) $30 time value, $6 intrinsic value,
    d) $30 intrinsic value, $6 time value.

Options Exercise - *Answer Sheet*

CORN:

Consider the purchase of a PUT option (right to sell) on corn futures.

December corn futures	$2.90 US/bu
PUT option price (premium)	$0.10 US/bu
PUT strike price	2.80
Futures floor price	$2.70 US/bu (2.80 strike less $0.10 premium)
Exchange Rate	$1.35 Cdn/US

The producer obtains the right to sell futures at $2.80 US/bu by buying a PUT option with a strike price of 2.80.

Questions:

1. *What would the 2.80 PUT be worth if December corn futures fell to $1.85 US/bu by November 1?*

Right to sell @ $2.80 US/bu -buy back futures @ $1.85 US/bu = $0.95 US/bu.

2. *Assuming the producer can still receive $0.65 Cdn/bu (adjusted basis) OVER the December corn, what cash price would be realized on November 1?*

$1.85 US/bu X 1.35 + $0.65 Cdn/bu (adjusted) = $3.15 Cdn/bu

3. *What price would the producer actually realize for the corn, considering the profit on the option and the returns from cash sales?*

Canadian $ = $1.35

Option premium value November 1:	$0.95	US/bu
less option premium paid:	(0.10)	US/bu
Profit	$0.85	US/bu

Plus cash sale: $3.15 Cdn/bu + ($0.85 X 1.35 = 1.1475) = $4.30 Cdn/bu

4. *If the producer was concerned about the Canadian dollar increasing in value relative to the US dollar what could the producer do to protect this exposure?*

The producer could buy a CALL option on the Canadian dollar.

5. *What is the size of one Canadian dollar contract?* $100,000 US

One Canadian dollar futures contract = $100,000.00 (see Appendix -Futures Contract Specs for CME Canadian dollar)

6. ***Would the producer be concerned about the Canadian dollar falling between April 15 and November 1?***

   No because a decline in the Canadian dollar, assuming one could still realize the same basis, would increase the returns, in Canadian dollars, from the PUT option.

7. ***What if the producer was planning to buy a new tractor or combine in the fall? Should the producer be concerned about a decline in the Canadian dollar?***

   Yes, because a decline in the Canadian dollar could increase the purchase price of the farm equipment.

8. ***What would happen to the producer's PUT option and realized cash returns if the December corn futures rose to $3.20 by November?***

   A 2.80 PUT option gives the producer the right, but not the obligation, to sell at $2.80 US/bu. However, futures are at $3.20 US/bu so the option would be worthless and left to expire.

   Assuming the producer can still receive $0.65 Cdn/bu OVER December futures for a cash bid, returns of $3.85 Cdn/bu should still be realized for the corn ($3.20 US/bu futures + $0.65 Cdn/bu basis). However, since the producer paid $0.10 US/bu for the option, this premium cost must be deducted from cash returns. So $0.10 X 1.35 = $0.135 Cdn/bu must be deducted from the producer's cash sale returns of $3.85 Cdn/bu. The producer's net realized return would be $3.715 Cdn/bu.

9. ***Was this effective price insurance?***

   Only you as the manager can decide which tool is the most effective.

   The advantage of the PUT option compared to a *short futures* position is that when prices do improve, the hedger can realize some of the price improvement. *Was this effective price insurance?*

Overheads For This Section

Chapter Objectives

Explain:

- Option contract
- Option premium
- Time decay
- Hedging with options

What Is An Option?

Call Option:

Gives the buyer the right but not the obligation to **buy** an underlying asset at a specified price.

Put Option:

Gives the buyer the right but not the obligation to **sell** an underlying asset at a specified price.

Answers to:
Land Example Questions

- Who is the **holder** of the right?
  The real estate broker representing a foreign interest

- Who is the **issuer or grantor** of the right?
  Pension fund

- What is the **underlying asset** of the option?
  Office building

- At what **price** will the deal be **struck** or the right **exercised**?
  $50 million

- What **premium** did the buyer or holder of the option pay?
  $100,000

- When does the buyer's right (option) **expire**?
  May 31

Answers to:
Land Example Questions

- What happens to the premium money if the option expires without being exercised?

  The seller of the option (pension fund) keeps the premium

- What happens to the premium money if the option is exercised by the buyer before or on the expiry date?

  The seller keeps the premium, plus $50 million for the building.

- What happens to the office building if the option expires without being exercised?

  The pension fund keeps the building.

- What happens to the office building if the option is exercised before or on the expiry date?

  The pension fund must sell the building to the real estate broker's clients for $50 million.

- When can buyer exercise their right?

  Anytime up to and including May 31

Options Components

- ***Buyer***:
  ⇨ Holder of the option

- ***Seller***:
  ⇨ Writer of the option

- ***Underlying Asset***:
  ⇨ A specified futures contract(s)

- ***Strike Price:***
  ⇨ Set in increments

- ***Premium***:
  ⇨ Determined by open outcry through bids and offers

- ***Expiry***:
  ⇨ Predetermined by the exchange

Call Option

Gives the buyer of the option the right, but not the obligation, to **buy** (go long) the underlying asset (futures contract) at a specified price within a specified time period.

Call Option - Example

DECEMBER LIVE CATTLE 70 US CALL AT 1.50 US

- **December Live Cattle futures** is the *underlying asset*.

- **$70 US/cwt** is the *strike price*.

- **Call** (right to buy) is the *option type*.

- **$1.50 US/cwt** is the *premium*.

Put Option

Gives the buyer of the option the right, but not the obligation, to **sell** (go short) the underlying asset (futures contract) at a specified price within a specified time period.

Put Option - Example

DECEMBER LIVE CATTLE 70 US PUT AT 1.50 US

- **December Live Cattle futures** is the *underlying asset.*

- **$70 US/cwt** is the *strike price.*

- **Put** (right to sell) is the *option type.*

- **$1.50 US/cwt** is the *premium.*

Option Rights and Obligations

Buyer:

- Pays premium
- Financial risk is limited to premium
- No margin calls
- Has the right but not obligation to take futures position:
  - ⇨ Right to buy futures with **call**
  - ⇨ Right to sell futures with **put**
- Right to offset or let the option expire

Option Rights and Obligations

Seller:

- Receives premium.
- Has risk of changes in futures price:

  ⇨ less the value of premium.
- Pay margin & margin calls.
- Obligation to provide futures position if exercised:

  ⇨ Sell futures if sold **call**;

  ⇨ Buy futures if sold **put**.
- Right to offset.

Option Premium Value

- Option price
- Determined through bids and offers
- Comprised of intrinsic + time value

Intrinsic Value

- Current option **profitability** if exercised
- Intrinsic value can only be a positive number
- Strike versus current underlying price

Time Value

- Premium **minus** intrinsic value
- Components:
  - ⇨ the time to expiry
  - ⇨ level of strike price
  - ⇨ price variability/volatility
  - ⇨ interest rates

Premium Value Put Options

($ US)

	Dec Corn Put Strike = $2.70		
Futures Price	$2.50	$2.70	$2.90
Premium	$0.25	$.05	$.05
Intrinsic Value	$0.20	$0.00	$0.00
Time Value	$0.05	$0.05	$0.05

Premium Value of Call Options

($ US)

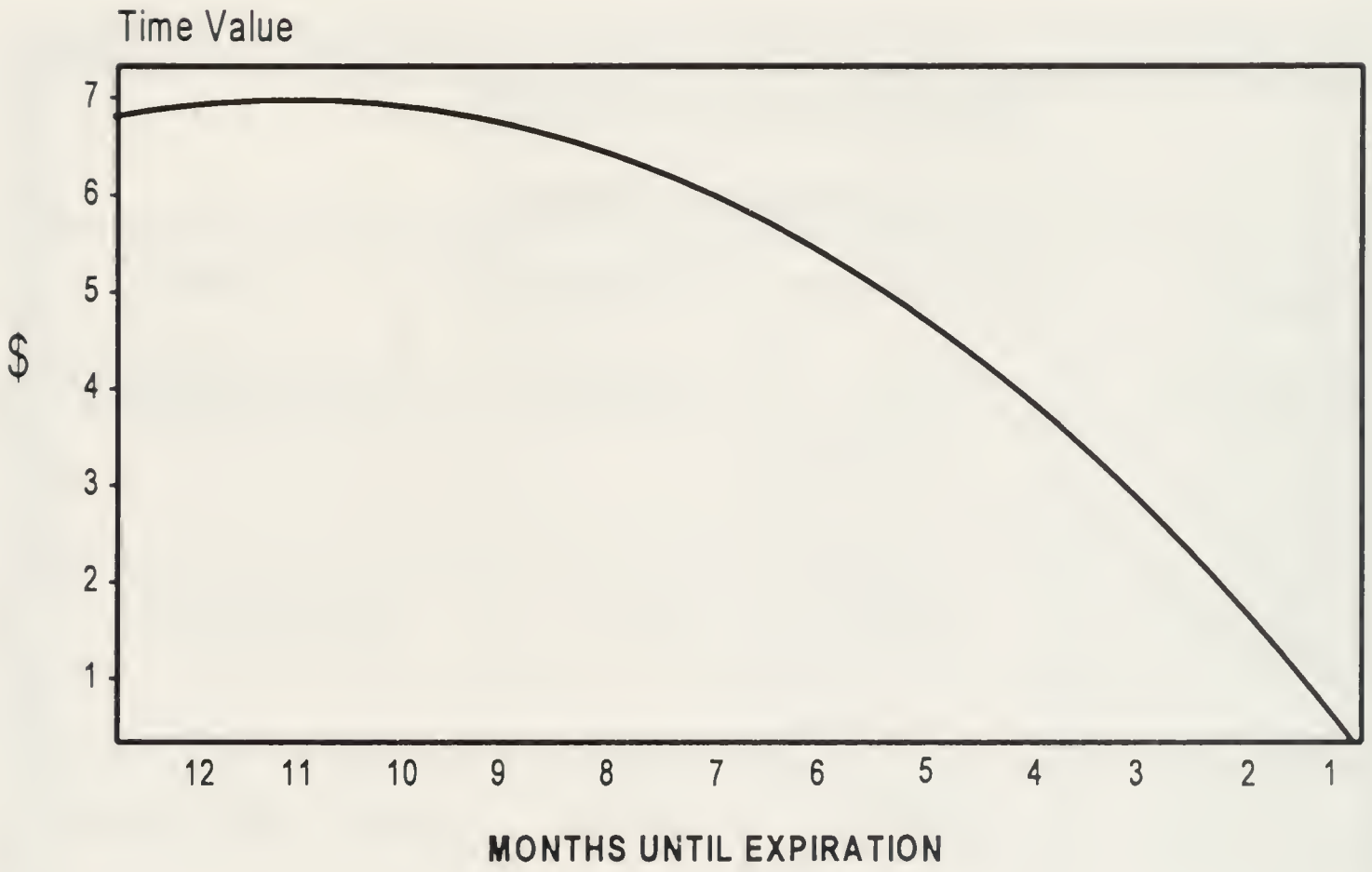
	Dec Corn Call Strike = $2.70		
Futures Price	$2.50	$2.70	$2.90
Premium	$.05	$.05	$0.25
Intrinsic Value	**$0.00**	**$0.00**	**$0.20**
Time Value	**$0.05**	**$0.05**	**$0.05**

Calculating Time Value And Intrinsic Value

OPTIONS ON SCOOBIES Scoobie Futures= $188.00			
STRIKE PRICE	**PREMIUM**	**INTRINSIC VALUE**	**TIME VALUE**
200 P*	$15.00		
200 C**	$8.00		
195 P	$14.00		
195 C	$10.00		
190 P	$12.50		
190 C	$10.50		
185 P	$9.00		
185 C	$12.00		
180 P	$6.00		
180 C	$16.00		

* P = PUT ** C = CALL

Time Decay of Options



Assumes Constant Futures Price And Volatility

Options Classifications

- Three (3) main classes.
- Compare strike to futures price.

In-the-Money Options

- Option profitable if exercised.
- Profit is intrinsic value.

In-the-Money Options

PUTS (P)	CALLS (C)
Strike price is greater than the futures.	Strike price is less than the futures.

Example:

December corn	November beans
2.70/bu P,	5.50/bu C,
Futures = $2.50/bu	Futures = $5.80/bu

Out-of-the-Money Options

- Option not profitable to exercise.
- Option premium only *time value*.

Out-of-the-Money Options

PUTS (P)	CALLS (C)
Strike price is less than the futures.	Strike price is greater than the futures.
Example:	
December corn	November beans
2.70/bu P,	5.50/bu C,
Futures = $2.78/bu	Futures = $5.41/bu

At-the-Money Options

- Strike equal to futures price, or

- When strike price close to futures price "near" or "close" to the money.

At-the-Money Options

PUTS (P)	CALLS (C)
Strike price is equal the futures price.	Strike price is equal to To the futures price.
Example:	
December corn	November beans
2.70/bu P,	5.50/bu C,
Futures = $2.70/bu	Futures = $5.50/bu

OPTIONS CLASSIFICATION EXERCISE

Draw a line to the appropriate classification from each condition ...

CONDITION	CLASSIFICATION
NOV 5.75 C, futures @ $6.00	
DEC 2.70 P, futures @ $2.80	
NOV 4.00 P, futures @ $3.60	
DEC 110 C, futures @ $110	
DEC 140 P, futures @ $110	
NOV 5.50 C, futures @ $5.62	
NOV 4.75 C, futures @ $5.00	
DEC 2.60 C, futures @ $2.50	
DEC 2.70 P, futures @ $2.70	

Time Decay -

At or Out-of-the-Money

- Options are a wasting asset:

  ⇨ time value declines

  ⇨ decay increases, last 60 to 30 days.

- Greater price certainty:

  ⇨ lower time value.

- Greater price uncertainty:

  ⇨ greater time value.

Time Decay - In-the-Money

- Decay more rapid when deep in-the-money:

  ⇨ expensive strike

  ⇨ discount time value to attract buyers.

Closing an Option Position

- Exercise option:

  ⇨ assigned a futures position.
- Let it expire.
- Offset the option.

When Option Exercised

Call:

- Buyer - long futures at strike price.
- Seller - short futures at strike price.

Put:

- Buyer - short futures at strike price.
- Seller - long futures at strike price.

Option Offset

- **Buyer - sell** identical option:

  ⇨ capture any time value.

- **Seller - buying** identical option.

Let Option Expire

- Do nothing:

  ⇨ no intrinsic value

  ⇨ time value less than exercise cost.

- **Automatically exercise - sometimes if ITM.**

How Options Work?

- Much like insurance
- Pays price protection

Advantages of Options - Seller

Put:

- Establish a minimum or floor price.
- Not giving up higher prices.

Call:

- Establish a maximum or ceiling price.
- not giving up lower prices.

Calculating Expected Price - Put Option

	Put option
Strike Price	$2.80/bu
+- Expected Basis	($0.20)/bu
- Premium	($0.10)/bu
= Expected Price	$2.50/bu

- If the basis remains unchanged the minimum price the producer will receive is $2.50/bu.
- The premium is deducted because it is a sales expense.

Ceiling Price - Call Option

	Call option
Strike Price	$2.80/bu
+- Expected Basis	($0.20)/bu
+ Premium	$0.10/bu
= Expected Price	$2.70/bu

- Basis unchanged maximum price is $2.70/bu.
- Premium is a purchase cost.

Chapter Summary

- Option buyer: right, but not obligation
- Similar to insurance
- Three classifications of options
- Intrinsic value & time value
- Advantages of options over futures
- Disadvantage of options

Options Quiz

1. ***An option premium is:***

   a) determined by the exchange;
   b) set at expiration;
   c) determined when exercised, or
   d) negotiated by open outcry.

2. ***A CALL option gives the buyer:***

   a) the right, but not the obligation, to sell a futures contract;
   b) the obligation to sell a futures contract;
   c) the right, but not the obligation, to buy a futures contract, or
   d) the obligation to buy a futures contract.

3. ***A CALL option with a strike price of $95.00 and the underlying futures at $105.00 is said to be:***

   a) out-of-the-money;
   b) a bad buy;
   c) at-the-money, or
   d) in-the-money.

4. ***A PUT option will protect the buyer against:***

   a) a price increase;
   b) a crop failure;
   c) a price decline, or
   d) a widening basis.

5. ***A CALL option with a strike price of $100.00 gives the buyer the right, but not the obligation, to:***

a) buy the underlying futures at $100.00;
b) sell the underlying futures at $100.00;
c) pay the premium, or
d) receive the premium.

6. ***When a CALL option is exercised, the seller of a CALL:***

a) receives a short futures position;
b) receives a long futures position;
c) receives the premium, or
d) pays the premium.

7. ***You have purchased a $90.00 wheat CALL option. To offset this option you would:***

a) sell a $90.00 wheat PUT;
b) sell a $90.00 wheat CALL;
c) buy a $90.00 wheat PUT;
d) exercise the option, or
e) let the option expire.

8. ***A wheat CALL with a strike price of $120.00 was bought for $8.00. The underlying futures are at $130.00. This option is said to:***

a) be out-of-the-money by $10.00;
b) have an intrinsic value of $2.00;
c) have an intrinsic value of $10.00, or
d) be at the buyer's break-even.

9. ***An option strike price is equal to the futures price of the underlying contract. The option is:***

a) out-of-the-money;
b) at-the-money;
c) in-the-money, or
d) deep in-the-money.

10. ***A PUT option with a strike price of $400.00 while the underlying futures are at $370.00 has a premium of $36.00. The premium is made up of:***

a) all time value;
b) all intrinsic value;
c) $30.00 time value, $6.00 intrinsic value, or
d) $30.00 intrinsic value, $6.00 time value.

Options Exercise

CORN:

Consider the purchase of a PUT option (right to sell) on corn futures.

December corn futures $2.90 US/bu

PUT option price (premium) $0.10 US/bu

PUT strike price 2.80

Futures floor price $2.70 US/bu

(2.80 strike less $0.10 premium)

The producer obtains the right to sell futures at $2.80 US/bu by buying a PUT option with a strike price of 2.80.

Answers: Options Exercise

1. What would the 2.80 PUT be worth if December corn futures fell to $1.85 US/bu by November 1?

   Right to sell @ $2.80 US/bu -buy back futures @ $1.85 US/bu = $0.95 US/bu.

2. Assuming the producer can still receive $0.65 Cdn/bu (unadjusted basis) OVER the December corn, what cash price would be realized on November 1?

   $1.85 US/bu + $0.65 Cdn/bu (unadjusted) = $2.50 Cdn/bu

3. What price would the producer actually realize for the corn, considering the profit on the option and the returns from cash sales?

   Canadian $ = $1.35

   Option premium value November 1:$0.95 US/bu

   less option premium paid: (0.10) US/bu

   Profit $0.85 US/bu

   Plus cash sale: $2.50 Cdn/bu + ($0.85 X 1.35 = 1.1475) = $3.6475 Cdn/bu

4. **If the producer was concerned about the Canadian dollar increasing in value relative to the US dollar what could the producer do to protect this exposure?**

   The producer could buy a CALL option on the Canadian dollar.

5. **What is the size of one Canadian dollar contract?**

   One Canadian dollar futures contract = $100,000.00 (see Appendix -Futures Contract Specs for CME Canadian dollar)

6. **Would the producer be concerned about the Canadian dollar falling between April 15 and November 1?**

   No because a decline in the Canadian dollar, assuming one could still realize the same basis, would increase the returns, in Canadian dollars, from the PUT option.

7. **What if the producer was planning to buy a new tractor or combine in the fall? Should the producer be concerned about a decline in the Canadian dollar?**

   Yes, because a decline in the Canadian dollar could increase the purchase price of the farm equipment.

8. What would happen to the producer's PUT option and realized cash returns if the December corn futures rose to $3.20 by November?

A 2.80 PUT option gives the producer the right, but not the obligation, to sell at $2.80 US/bu. However, futures are at $3.20 US/bu so the option would be worthless and left to expire.

Assuming the producer can still receive $0.65 Cdn/bu OVER December futures for a cash bid, returns of $3.85 Cdn/bu should still be realized for the corn ($3.20 US/bu futures + $0.65 Cdn/bu basis). However, since the producer paid $0.10 US/bu for the option, this premium cost must be deducted from cash returns. So $0.10 X 1.35 = $0.135 Cdn/bu must be deducted from the producer's cash sale returns of $3.85 Cdn/bu. The producer's net realized return would be $3.715 Cdn/bu.

9. Was this effective price insurance?

Only you as the manager can decide which tool is the most effective.

The advantage of the PUT option compared to a *short futures* position is that when prices improve, the hedger can realize some of the price improvement. *Was this effective price insurance?*

HEDGING

Overview

This section is designed to provide the reader with practical examples of how hedging works and the outcome of a hedge when prices increase and decrease. There are short hedging examples for 5 different commodities. We have also included 2 cases for a user of a commodities (long hedge). Each commodity has a futures hedge and a options hedge in order to demonstrate the advantages and disadvantages of each.

Objectives

At the end of this Chapter, the participants will understand:

1. The mechanics of a hedge. How and why it is done.
2. The long hedge. Procurement strategies for the commodity buyer.
3. The short hedge. Price protection for the commodity seller/producer.
4. The concept and importance of price risk management in your marketing plan.

Suggestions to Facilitators

The Hedging Concept

There will not be sufficient time to cover every example and thus, you should select those examples which are of interest to your audience or which are appropriate to your region of the country. In order to make the course material more realistic we have included blank overheads for you to do real life examples. We would suggest that you use the daily paper to get current price quotes and have the students hedge their production just like they would at home. You can provide the production information and decide what the final prices are.

Production Risk

Producers of grains and oilseeds must always be aware of the production risks due to hail, drought, frost, etc.. Production shortfalls or higher than expected yields will impact on the effectiveness of the hedge. It should be stressed to the participants that because of this production risk, grain and oilseed producers should limit their use of futures contracts to **a portion of their expected production ahead of harvest**.

Terminology to define in this section:

- Hedging with futures
- Hedging with options

List of Overheads

Visual aids for this chapter include:

Overhead #	**Title**
1.	Chapter Objectives.
2.	What is Hedging? (2)
4.	Futures and Option Hedge- Producer.
5.	Futures and Option Hedge- Feedlot.
6.	Futures and Option Hedge- Elevator.
7.	Short Futures Hedge - Cattle Example - Decline in Price.
8.	Short Options Hedge - Cattle Example - Decline in Price.
9.	Short Futures Hedge - Cattle Example - Rise in Price.
10.	Short Options Hedge - Cattle Example - Rise in Price.
11.	Short Futures Hedge - Hog Example - Decline in Price.
12.	Short Options Hedge - Hog Example - Decline in Price.
13.	Short Futures Hedge - Hog Example - Rise in Price.
14.	Short Options Hedge - Hog Example - Rise in Price.
15.	Long Futures Hedge - Feed Barley - Rise in Price.
16.	Long Options Hedge - Feed Barley - Rise in Price.
17.	Long Futures Hedge - Feed Corn - Rise in Price.
18.	Long Options Hedge - Feed Corn - Rise in Price.
19.	Short Futures Hedge - Corn Example - Decline in Price.
20.	Short Options Hedge - Corn Example - Decline in Price.

21. Short Futures Hedge - Corn Example - Rise in Price.
22. Short Options Hedge - Corn Example - Rise in Price.
23. Short Futures Hedge - Soybeans Example - Decline in Price.
24. Short Options Hedge - Soybeans Example - Decline in Price.
25. Short Futures Hedge - Soybeans Example - Rise in Price.
26. Short Options Hedge - Soybeans Example - Rise in Price.
27. Short Futures Hedge - Barley Example - Decline in Price.
28. Short Options Hedge - Barley Example - Decline in Price.
29. Short Futures Hedge - Barley Example - Rise in Price.
30. Short Options Hedge - Barley Example - Rise in Price.
31. Short Futures Hedge - Canola Example - Decline in Price.
32. Short Options Hedge - Canola Example - Decline in Price.
33. Short Futures Hedge - Canola Example - Rise in Price.
34. Short Options Hedge - Canola Example - Rise in Price.
35. Yield Risk and Futures.
36. Yield Risk and Options
37. Chapter Summary - Producers.
38. Chapter Summary - Inputs.
39. Points to Remember.
40. Hedging Quiz.
41. Long Futures Hedge - Blank
42. Short Futures Hedge - Blank
43. Long Options Hedge - Blank
44. Short Options Hedge - Blank

Hedging Quiz

1. **A futures contract is _____ defining quality, quantity, delivery location and time of the specified contract. The buyer and seller are left to negotiate _____ and _____ .**

   a) fixed, lunch, who pays
   b) paper, price, quality
   c) standardized, price, number of contracts
   d) intangible, volume, open interest

2. **A hedger is someone who_____.**

   a) trims hedges for a living
   b) sells futures
   c) has a financial interest in a physical commodity and uses some product (i.e. futures, options) to protect against an adverse price move.
   d) has no financial interest in physical or cash commodities

3. **A short hedger is typically a _____.**

   a) stock broker
   b) grain and oilseed processor
   c) one who sells futures to protect inventory, current or expected, from a price decline.
   d) a feed grain user

4. **A person who buys futures to protect themselves against an adverse price move is a _____.**

   a) futures trader
   b) speculator
   c) short hedger
   d) long hedger
   e) arbitrager

Overheads For This Section

Chapter Objectives

- Explain:
  - Mechanics of hedge
  - Short hedge
  - Long hedge
  - Price risk management

What is Hedging?

To Hedge with futures or options is to take an equal but opposite position to the cash position to reduce the risk of adverse price movements.

What is Hedging?

Options give the hedger the alternative of having a right but not the obligation to buy or sell a futures contract.

Futures And Option Hedge - Producer

Cash Position	Futures Position	Options Position
Future sale of product - long cash - protect against lower price	Sells futures	Buys a put

Futures and Option Hedge - Feedlot

Cash Position	Futures Position	Cash Position
Future purchase of product: - short cash - protect against higher price	Buys futures	Buys a call

Futures and Option Hedge - Elevator

Cash Position	Futures Position	Options Position
Buys cash for inventory: - long cash - protect against lower price	Sells futures	Buys a put
Forward sale, selling cash: - short cash - protect against higher price	Buys futures	Buys a call

Short Futures Hedge
Cattle - Decline in Price:

Assumptions: Basis is unchanged @ $9.00 Cdn/cwt Under.

TRANSACTION	CASH POSITION	JUNE FUTURES*
FEBRUARY 1:		
Expected Cash Selling Price	$80.10 Cdn/cwt	
Sell Futures		$89.10 Cdn/cwt
MAY 20:		
Actual Cash Selling Price	$75.04 Cdn/cwt	
Buy Futures		$84.04 Cdn/cwt
Profit (Loss)	($5.06) Cdn/cwt	$5.06 Cdn/cwt

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $66.00 US X 1.35 = $89.10 Cdn.**

Short Options Hedge
Cattle - Decline in Price:

Assumptions: Basis is unchanged @ $9.00 Cdn/cwt Under.

TRANSACTION	CASH POSITION	June Option Strike Price = $89.10 Cdn/cwt
FEBRUARY 1: Expected Cash Selling Price	$80.10 Cdn/cwt	
Buy June Put		($2.00 Cdn/cwt)
MAY 20: Actual Cash Selling Price	$75.04 Cdn/cwt	
Sell June Put		$5.06 Cdn/cwt
Profit (Loss)	($5.06) Cdn/cwt	$3.06 Cdn/cwt

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $66.00 US X 1.35 = $89.10 Cdn.**

Short Futures Hedge
Cattle - Rise in Price:

Assumptions: Basis is unchanged @ $9.00 Cdn/cwt Under.

TRANSACTION	CASH POSITION	JUNE FUTURES*
FEBRUARY 1: Expected Cash Selling Price Sell Futures	$80.10 Cdn/Cwt	 $89.10 Cdn/cwt
MAY 20: Actual Cash Selling Price Buy Futures	$85.50 Cdn/cwt	 $94.50 Cdn/cwt
Profit (Loss)	$5.40 Cdn/cwt	($5.40) Cdn/cwt

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $66.00 US X 1.35 = $89.10 Cdn.**

Short Options Hedge
Cattle - Rise in Price:

Assumptions: Basis is unchanged @ $9.00 Cdn/cwt Under.

TRANSACTION	CASH POSITION	June Option Strike Price = $89.10 Cdn/cwt
FEBRUARY 1:		
Expected Cash Selling Price	$80.10 Cdn/cwt	
Buy June Put		($2.00 Cdn/cwt)
MAY 20:		
Actual Cash Selling Price	$85.50 Cdn/cwt	
Sell June Put		$0.00 Cdn/cwt
Profit (Loss)	$5.40 Cdn/cwt	($2.00 Cdn/cwt)

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $66.00 US X 1.35 = $89.10 Cdn.**

Short Futures Hedge
Hogs - Decline in Price:

Assumptions: Basis is unchanged @ $15.00 Cdn/ckg Under.

TRANSACTION	CASH POSITION	FEBRUARY FUTURES*
NOVEMBER 1:		
Expected Cash Selling Price	$200.00 Cdn/ckg	
Sell Futures		$215.00 Cdn/ckg
JANUARY 25:		
Actual Cash Selling Price	$180.00 Cdn/ckg	
Buy Futures		$195.00 Cdn/ckg
Profit (Loss)	($20.00) Cdn/ckg	$20.00 Cdn/ckg

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $159.26 US X 1.35 = $215.00 Cdn.**

Short Options Hedge
Hogs - Decline in Price:

Assumptions: Basis is unchanged @ $15.00 Cdn/ckg Under.

TRANSACTION	CASH POSITION	FEB Option Strike Price = $215.00 Cdn/ckg
NOVEMBER 1: Expected Cash Selling Price	$200.00 Cdn/ckg	
Buy Feb Put		($4.00 Cdn/ckg)
JANUARY 25: Actual Cash Selling Price	$180.00 Cdn/ckg	
Sell Feb Put		$20.10 Cdn/ckg
Profit (Loss)	($20.00) Cdn/ckg	$16.10 Cdn/ckg

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $159.26 US X 1.35 = $215.00 Cdn.**

Short Futures Hedge
Hogs - Rise in Price:

Assumptions: Basis is unchanged @ $15.00 Cdn/ckg Under.

TRANSACTION	CASH POSITION	FEBRUARY FUTURES*
NOVEMBER 1:		
Expected Cash Selling Price	$200.00 Cdn/ckg	
Sell Futures		$215.00 Cdn/ckg
JANUARY 25:		
Actual Cash Selling Price	$225.00 Cdn/ckg	
Buy Futures		$240.00 Cdn/ckg
Profit (Loss)	$25.00 Cdn/ckg	($25.00) Cdn/ckg

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $159.26 US X 1.35 = $215.00 Cdn.**

Short Options Hedge Hogs - Rise in Price:

Assumptions: Basis is unchanged @ $15.00 Cdn/ckg Under.

TRANSACTION	CASH POSITION	FEB Option Strike Price = $215.00 Cdn/ckg
NOVEMBER 1: Expected Cash Selling Price	$200.00 Cdn/ckg	
Buy Feb Put		($4.00 Cdn/ckg)
JANUARY 25: Actual Cash Selling Price	$225.00 Cdn/ckg	
Sell Feb Put		$0.10 Cdn/ckg
Profit (Loss)	$25.00 Cdn/ckg	($3.90) Cdn/ckg

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $159.26 US X 1.35 = $215.00 Cdn.**

Long Futures Hedge
Feed Barley - Rise in Price:

Assumptions: Basis is unchanged @ $25.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	DEC FUTURES*
OCTOBER 1: Expected Cash Buying Price Buy Dec Futures	120.00Cdn/mt	 $145.00Cdn/mt
DECEMBER 1: Actual Cash Buying Price Sell Dec Futures	$150.00 Cdn/mt	 $175.00 Cdn/mt
Profit (Loss)	($30.00) Cdn/mt	$30.00 Cdn/mt

The December Western Barley futures contract is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange. The conversion factor is 45.92 bu = 1mt.

Long Options Hedge
Feed Barley - Rise in Price:

Assumptions: Basis is unchanged @ $25.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	Dec Option Strike Price = $145.00 Cdn/mt
February 1: Expected Cash Buying Price Buy July Call	$120.00Cdn/mt	 ($7.00) Cdn/mt
May 20: Actual Cash Buying Price Sell July Call	$150.00Cdn/mt	 $30.00 Cdn/mt
Profit (Loss)	($30.00 Cdn/mt)	$23.00 Cdn/mt

The December Western Barley futures contract is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange. The conversion factore is 45.92 bu = 1mt.

Long Futures Hedge
Feed Corn - Rise in Price:

Assumptions: Basis is unchanged @ $0.13 Cdn/bu Under.

TRANSACTION	CASH POSITION	JULY FUTURES*
FEBRUARY 1: Expected Cash Buying Price Buy Futures	$3.38 Cdn/bu	 $3.51 Cdn/bu
MAY 20: Actual Cash Buying Price Sell Futures	$4.73 Cdn/bu	 $4.86 Cdn/bu
Profit (Loss)	($1.35) Cdn/bu	$1.35 Cdn/bu

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $2.50 US X 1.35 = $3.51 Cdn.**

Long Options Hedge
Feed Corn - Rise in Price:

Assumptions: Basis is unchanged @ $0.13 Cdn/bu Under.

TRANSACTION	CASH POSITION	July Option Strike Price = $3.51 Cdn/bu
February 1: Expected Cash Buying Price Buy July Call	$3.38 Cdn/bu	($0.16) Cdn/bu
May 20: Actual Cash Buying Price Sell July Call	$4.73 Cdn/bu	$1.40 Cdn/bu
Profit (Loss)	($1.35 Cdn/bu)	$1.24 Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn, i.e., $2.85 US X 1.35 = $3.85 Cdn**

Short Futures Hedge
Corn - Decline in Price

Assumptions: Basis is unchanged @ $0.35 Cdn/bu Under.

TRANSACTION	CASH POSITION	DECEMBER FUTURES*
APRIL 15: Expected Cash Selling Price	$3.50 Cdn/bu	
Sell Futures		$3.85 Cdn/bu
NOVEMBER 1: Actual Cash Selling Price	$2.50 Cdn/bu	
Buy Futures		$2.85 Cdn/bu
Profit (Loss)	($1.00) Cdn/bu	$1.00 Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn, i.e., $2.85 US X 1.35 = $3.85 Cdn**

Short Options Hedge
Corn - Decline in Price

Assumptions: Basis is unchanged @ $0.35 Cdn/bu Under.

TRANSACTION	CASH POSITION	December Option Strike Price = $3.85 Cdn/bu
APRIL 15: Expected Cash Selling Price Buy December Put	$3.50 Cdn/bu	 ($0.16) Cdn/bu
NOVEMBER 1: Actual Cash Selling Price Sell December Put	$2.50 Cdn/bu	 $1.01 Cdn/bu
Profit (Loss)	($1.00) Cdn/bu	$0.85 Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn, i.e., $2.85 US X 1.35 = $3.85 Cdn**

Short Futures Hedge
Corn - Rise in Price

Assumptions: Basis is unchanged @ $0.35 Cdn/bu Under.

TRANSACTION	CASH POSITION	DECEMBER FUTURES*
APRIL 15:		
Expected Cash Selling Price	$3.50 Cdn/bu	
Sell Futures		$3.85 Cdn/bu
NOVEMBER 1:		
Actual Cash Selling Price	$3.80 Cdn/bu	
Buy Futures		$4.15 Cdn/bu
Profit (Loss)	$0.30 Cdn/bu	($0.30) Cdn/bu

***The US futures price is converted to Cdn using the following exchange rate: US $ @ $1.35 Cdn, i.e., $2.85 US X 1.35 = $3.85 Cdn.**

Short Options Hedge
Corn - Rise in Price

Assumptions: Basis is unchanged @ $0.35 Cdn/bu Under.

TRANSACTION	CASH POSITION	DECEMBER OPTION Strike Price = $3.85 Cdn/bu
APRIL 15:		
Expected Cash Selling Price	$3.50 Cdn/bu	
Buy December Put		($0.16) Cdn/bu
NOVEMBER 1:		
Actual Cash Selling Price	$3.80 Cdn/bu	
Sell December Put		$0.01 Cdn/bu
Profit (Loss)	$0.30 Cdn/bu	($0.15) Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn, i.e.,**
$2.85 US X 1.35 = $3.85 Cdn

Short Futures Hedge
Beans - Decline in Price:

Assumptions: Basis is unchanged @ $1.10 Cdn/bu Under.

TRANSACTION	CASH POSITION	NOVEMBER FUTURES
APRIL 15: Expected Cash Selling Price Sell November Futures	$8.00 Cdn/bu	 $9.10 Cdn/bu
October 20: Actual Cash Selling Price Buy November Futures	$6.00 Cdn/bu	 $7.10 Cdn/bu
Profit (Loss)	($2.00) Cdn/bu	$2.00 Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn,**

i.e., $6.74 US X 1.35 = $9.10 Cdn

Short Options Hedge
Beans - Decline in Price:

Assumptions: Basis is unchanged @ $1.10 Cdn/bu Under.

TRANSACTION	CASH POSITION	NOVEMBER OPTION Strike Price = $9.10 Cdn/bu
APRIL 15: Expected Cash Selling Price Buy November Put	$8.00 Cdn/bu	 ($1.42) Cdn/bu
October 20: Actual Cash Selling Price Sell November Put	$6.00 Cdn/bu	 $2.05 Cdn/bu
Profit (Loss)	($2.00) Cdn/bu	$0.63 Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn,**

i.e., $6.74 US X 1.35 = $9.10 Cdn

Short Futures Hedge
Beans - Rise in Price:

Assumptions: Basis is unchanged @ $1.10 Cdn/bu Under.

TRANSACTION	CASH POSITION	NOVEMBER FUTURES
APRIL 15: Expected Cash Selling Price	$8.00 Cdn/bu	
Sell November Futures		$9.10 Cdn/bu
October 20: Actual Cash Selling Price	$9.75 Cdn/bu	
Buy November Futures		$10.85 Cdn/bu
Profit (Loss)	$1.75 Cdn/bu	($1.75) Cdn/bu

***The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn,**

i.e., $6.74 US X 1.35 = $9.10 Cdn

Short Options Hedge
Beans - Rise in Price:

Assumptions: Basis is unchanged @ $1.10 Cdn/bu Under.

TRANSACTION	CASH POSITION	NOVEMBER OPTION Strike Price = $9.10 Cdn/bu
APRIL 15: Expected Cash Selling Price Buy November Put	$8.00 Cdn/bu	 ($1.42) Cdn/bu
October 20: Actual Cash Selling Price Sell November Put	$9.75 Cdn/bu	 $0.05 Cdn/bu
Profit (Loss)	$1.75 Cdn/bu	($1.37) Cdn/bu

*The US futures price is converted to Cdn using the exchange rate: US $ @ $1.35 Cdn,

i.e., $6.74 US X 1.35 = $9.10 Cdn

Short Futures Hedge
Barley - Decline in Price:

Assumptions: Basis is unchanged @ $25.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	DECEMBER FUTURES
APRIL 15:		
Expected Cash Selling Price	$120.00 Cdn/mt	
Sell Futures		$145.00 Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$75.00 Cdn/mt	
Buy Futures		$100.00 Cdn/mt
Profit (Loss)	($45.00) Cdn/mt	$45.00 Cdn/mt

*The December Western Barley futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Options Hedge
Barley - Decline in Price:

Assumptions: Basis is unchanged @ $25.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	December Option Strike Price = $145 Cdn/mt
APRIL 15:		
Expected Cash Selling Price	$120.00 Cdn/mt	
Buy December Put		($7.00) Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$75.00 Cdn/mt	
Sell December Put		$46.00 Cdn/mt
Profit (Loss)	($45.00) Cdn/mt	$39.00 Cdn/mt

*The December Western Barley futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Futures Hedge
Barley - Rise in Price:

Assumptions: Basis is unchanged @ $25.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	DECEMBER FUTURES
APRIL 15:		
Expected Cash Selling Price	$120.00 Cdn/mt	
Sell Futures		$145.00 Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$150.00 Cdn/mt	
Buy Futures		$175.00 Cdn/mt
Profit (Loss)	$30.00 Cdn/mt	($30.00) Cdn/mt

*The December Western Barley futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Options Hedge
Barley - Decline in Price:

Assumptions: Basis is unchanged @ $25.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	December Option Strike Price = $145 Cdn/mt
APRIL 15:		
Expected Cash Selling Price	$120.00 Cdn/mt	
Buy December Put		($7.00) Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$150.00 Cdn/mt	
Sell December Put		$1.00 Cdn/mt
Profit (Loss)	$30.00 Cdn/mt	($6.00) Cdn/mt

*The December Western Barley futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Futures Hedge
Canola - Decline in Price:

Assumptions: Basis is unchanged @ $12.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	NOVEMBER FUTURES
APRIL 15:		
Expected Cash Selling Price	$353.00 Cdn/mt	
Sell November Futures		$365.00 Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$270.00 Cdn/mt	
Buy November Futures		$282.00 Cdn/mt
Profit (Loss)	($83.00) Cdn/mt	$83.00 Cdn/mt

*The November Western Canola futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Options Hedge
Canola - Rise in Price:

Assumptions: Basis is unchanged @ $12.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	November Option Strike Price = $365 Cdn/mt
APRIL 15:		
Expected Cash Selling Price	$353.00 Cdn/mt	
Buy November Put		($14.00) Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$270.00 Cdn/mt	
Sell November Put		$84.00 Cdn/mt
Profit (Loss)	($83.00) Cdn/mt	$70.00 Cdn/mt

*The November Western Canola futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Futures Hedge
Canola - Rise in Price:

Assumptions: Basis is unchanged @ $12.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	NOVEMBER FUTURES
APRIL 15:		
Expected Cash Selling Price	$353.00 Cdn/mt	
Sell November Futures		$365.00 Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$388.00 Cdn/mt	
Buy November Futures		$400.00 Cdn/mt
Profit (Loss)	$35.00 Cdn/mt	($35.00) Cdn/mt

*The November Western Canola futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Short Options Hedge
Canola - Rise in Price:

Assumptions: Basis is unchanged @ $12.00 Cdn/mt Under.

TRANSACTION	CASH POSITION	November Option Strike Price = $365 Cdn/mt
APRIL 15:		
Expected Cash Selling Price	$353.00 Cdn/mt	
Buy November Put		(14.00) Cdn/mt
OCTOBER 20:		
Actual Cash Selling Price	$388.00 Cdn/mt	
Sell November Put		$1.00 Cdn/mt
Profit (Loss)	$35.00 Cdn/mt	($13.00) Cdn/mt

*The November Western Canola futures price is denominated in Cdn dollars and traded on the Winnipeg Commodity Exchange.

Yield Risk And Futures

- Yield risk:
  - ⇨ yield not realized;
  - ⇨ futures price rises;
  - ⇨ loss results on short futures position;
  - ⇨ no offsetting gain in cash market.
- Solution:
  - ⇨ initially hedge only portion of expected yield;
  - ⇨ as yield more certain, hedge more of crop.

Yield Risk and Options

- Maximum risk of loss is premium.

- Yield does not materialize:
  - ⇨ let the extras option expire;
  - ⇨ lose the premium.

- May be able to offset - recoup some premium.

Chapter Summary - Producers

- Short hedge against price decline
- Short hedgers long cash commodity
- Buys back futures when product sold
- Currency long hedge:
  - protect against increase in value Cdn dollar;
  - decline in Cdn price versus US.

Chapter Summary - Inputs

- Long hedge - protect against price increase
- Long hedger is short cash product
- Long hedger sells back futures contracts:
  - with purchase of cash product.
- Currency short hedge:
  - protect against decrease in Cdn dollar;
  - increase in Cdn price versus US.

Points to Remember

- Hedging:
  - offset between futures and cash market;
  - gains/losses in both markets related.
- Price uncertainty
- Potential negative impact on viability
- Hedging can be effective risk management tool

Hedging Quiz

1. **A futures contract is _____ defining quality, quantity, delivery location and time of the specified contract. The buyer and seller are left to negotiate _____ and _____ .**

   a) fixed, lunch, who pays
   b) paper, price, quality
   c) standardized, price, number of contracts
   d) intangible, volume, open interest

2. **A hedger is someone who_____.**

   a) trims hedges for a living
   b) sells futures
   c) has a financial interest in a physical commodity and uses some product (i.e. futures, options) to protect against an adverse price move.
   d) has no financial interest in physical or cash commodities

3. **A short hedger is typically a _____.**

   a) stock broker
   b) grain and oilseed processor
   c) one who sells futures to protect inventory, current or expected, from a price decline.
   d) a feed grain user

4. **A person who buys futures to protect themselves against an adverse price move is a _____.**

   a) futures trader
   b) speculator
   c) short hedger
   d) long hedger
   e) arbitrager

Long Futures Hedge -

_____

Assumptions: Basis is - _____

TRANSACTION	**CASH POSITION**	_____ **Futures**
Date: _____ Expected Cash Purchase Price Buy Futures		
Date: _____ Actual Cash Purchase Price Sell Futures		
Profit (Loss)		

Short Futures Hedge -

_____

Assumptions: Basis is - _____

TRANSACTION	CASH POSITION	_____ Futures
Date: _____ Expected Cash Selling Price Sell Futures		
Date: _____ Actual Cash Selling Price Buy Futures		
Profit (Loss)		

Long Options Hedge -

_____

Assumptions: Basis is - _____

TRANSACTION	**CASH POSITION**	**_____ Option Strike = Price**
Date: _____ Expected Cash Purchase Price Buy Call		
Date: _____ Actual Cash Purchase Price Sell Call		
Profit (Loss)		

Short Options Hedge -

_____

Assumptions: Basis is - _____

TRANSACTION	**CASH POSITION**	**_____ Option Strike = Price**
Date: _____ Expected Cash Selling Price Buy Put		
Date: _____ Actual Cash Selling Price Sell Put		
Profit (Loss)		

MANAGING EXCHANGE RATE RISK

Overview

Many of the commodities that we produce or use as inputs in Canadian agriculture are priced in US dollars and traded on US future exchanges. This adds an additional source of risk through the effect of the exchange rate. The exchange rate affects the local price when the US price is converted to the Canadian equivalent. The result is that when the exchange rate changes, **the Canadian cash price changes even though the US futures price does not change**. Thus, when a producer (buyer) hedges the profit or loss on the futures only partially offsets the profit or loss on the cash sale (purchase).

A second and lesser effect is that the profit or loss on the the futures transaction is calculated in US funds and will be more or less than expected depending on the exchange rate when the hedge is lifted (i.e. the higher the Canadian dollar, the smaller the profit or loss in Canadian dollars). The first effect is by far the greater risk and can be managed by hedging the Canadian dollar.

Objectives

At the end of this Chapter, the participants will understand:

1. The exchange rate risk for Canadian commodities priced and hedged in the US market.
2. How to hedge the dollar.
3. The size of the dollar position required to hedge a commodity position.

Suggestions to Facilitators

You should start by showing the participants that the Canadian US exchange rate can be quoted in two ways:
- Canadian dollars per US Dollar or,
- US Dollars per Canadian dollar.

Participants should be used to either quote. One is simply the reciprocal of the other ($1.00/$0.7300 = $1.3699 Cdn per US $) or ($1.00/$1.3699 = $0.7300 US per Cdn $).

It is important for you as a facilitator to work through all the examples to ensure that you understand and can reproduce each one.

In the first example, we show a short cattle hedge. The final net price for the cattle is exactly as expected because the **adjusted basis** and the exchange rate did not change. Relating this back to chapter 1, this outcome means that the producer has no price risk because the final price of the cattle, with the hedge, is the same as the expected price. This example shows that the outcome is the same, regardless if the futures price goes up or down, as long as the adjusted basis and the exchange rate does not change.

The next example shows what happens with a hedge when the Canadian dollar strengthens and the adjusted basis remains constant. The local cash price is lower since it takes fewer Canadian dollars to purchase US dollars. This unfavourable move in the exchange rate means a considerable loss to the producer on the cattle.

The farmer's net realized price for the cattle is $82.50 Cdn/cwt., regardless if the futures price rises or falls. The $7.00 Cdn/cwt. drop in the net price from $89.50 Cdn/cwt. is the result of the farmer's exchange rate risk. This amounts to a loss of $2,800 Cdn for each 40,000 lb. Cattle contract. Here again, you can refer back to Chapter 1 and point out the implication of this kind of loss, **which is not caused by any change in the cattle market,** to the cash flow of the enterprise.

At this point we should show the participants how to calculate the number of Canadian dollar contracts required to hedge the exchange rate. A Canadian dollar futures contract is $100,000 Cdn and is traded in US $. To determine the number of futures contracts required to hedge your commodity risk first, determine the expected value of the commodity in Cdn $. Using the cattle example, suppose you hedge 80,000 lbs. and your expected net price is $89.50 Cdn/cwt. The Cdn $ value of the cattle is $71,600 Cdn.

The number of Cdn $ contracts needed to hedge a position can be approximated by dividing the face value of the commodity in Canadian funds by $100,000. So given a value of $71,600 Cdn the grower needs .716 dollar contracts ($71,600 ÷ $100,000). Since commodity values are not measured in standard blocks of $100,000 Cdn there will be a mismatch. It is up to the hedger to determine whether to round up or down when determining the number of currency contracts required to cover the currency risk. There are smaller contracts (mini-contracts) offered by the Mid America Exchange in the amount of $50,000 Cdn.

The next step is this chapter is to explain to the participants how to hedge the exchange rate and the effects of hedging the exchange rate, by taking a long position in Canadian dollar futures. The final step is for the participants to simply turn all this around and think about a long hedge. A long commodity hedge faces the risk, that the commodity price may rise and that the dollar may fall. The appropriate dollar hedge in such a case, is to sell Canadian dollar futures.

You should conclude this chapter by showing how options can be used to manage exchange rate risk. You should stress to the participants that the advantage of the option is that is protects against an adverse movement in the exchange rate while at the same time any beneficial currency change due to the exchange rate is not given up by the holder of the option.

For a short commodity hedger the exchange rate risk can be offset by purchasing a call option. As the Canadian dollar appreciates the US$ value of a Canadian dollar increases making the value of the call greater. The increased value of the Canadian dollar option helps to offset the lower Canadian cash price resulting from the change in the exchange rate.

The long commodity hedger can use a put option to offset the risk of a depreciation in the Canadian dollar. The increase in the value of the put option will help offset the increased cost of inputs due to the weaker Canadian dollar.

As with the last chapter, it is always useful to add a current, or at least a different example. A common question is how to hedge exchange rate risk on a basis contract. It makes a good example, and the answer is the same as a forward contract.

List of Overheads

Visual aids for this chapter include:

Overhead # **Title**

1. Chapter Objectives.
2. Exchange Rates Quotes.
3. Expected Price - Live Cattle.
4. Short Cattle Futures Hedge: Exchange Rate = $1.35 US.
5. Short Cattle Futures Hedge: Exchange Rate = $1.25 US.
6. Futures And Basis Levels: Variable Exchange Rate.
7. Hedging The Exchange Rate - Producer.
8. Hedging The Exchange Rate - Inputs.
9. Number of Canadian $ Contracts.
10. Canadian $ And Short Cattle Hedge (Appreciating Cdn $).
11. Canadian $ And Short Soybean Hedge (Appreciating Cdn $).
12. Canadian $ And Long Corn Hedge (Depreciating Cdn $).
13. Options on Canadian Exchange Rate.
14. Chapter Summary.
15. Exchange Rate Risk Questions.
16. Canadian $ and Long Hedge - Blank.
17. Canadian $ and Short Hedge - Blank.

Exchange Rate Questions

A feedlot operator hedges by selling four live cattle contracts at $75.00 US/cwt and buying four corn contracts at $3.00 US/bu. The corn against which the corn hedge was placed will be purchased in April, at which time the corn hedge will be liquidated. The cattle against which the cattle hedge was placed will be sold in September, at which time the cattle hedge will be liquidated. Based on the above information:

The Canadian dollar is trading at $0.72 US.

a) What is the nature of the exchange rate risk on the cattle hedge?

b) What is the nature of the exchange rate risk on the corn hedge?

c) How much net exchange rate exposure does the feedlot operator have?

d) How can the feedlot operator hedge it?

e) Does the exchange rate exposure change in April when the corn hedge is liquidated and, if so, how does the feedlot operator hedge this new position?

Answers to the Questions

a) That exchange rate will rise.

b) That exchange rate will fall.

c) $83, 333.33

(4 cattle contracts X 40,000 lbs ea X 0.75) ÷ $0.72 =	$166,666.66
(4 corn contracts X 5,000 bu ea X $3.00/bu) ÷ $0.72 =	($83,333.33)
	$83,333.33

d) By buying one futures contract of dollars or one mini contract. In the first case, the hedge position will be greater than the exposure. In the second case, the hedge position will be less than the exposure.

e) Yes, because the short dollar risk will no longer exist. The amount of the exposure will depend upon the cattle futures price and the exchange rate when the corn hedge is lifted. The new position would be hedged by adding a mini contract or a full dollar contract.

Overheads For This Section

Chapter Objectives

Explain:

- Exchange rate risk
- Hedging the Canadian dollar
- Size of the hedge

Exchange Rate Quotes

- Two types of exchange rate quotes.

  1. Canadian dollar trading at $1.3699 Cdn:
     ⇨ $1.3699 Cdn to buy $1.00 US

  2. Canadian dollar trading at $0.7300 US:
     ⇨ $0.7300 US to buy $1.00 Cdn

- **One is the reciprocal of the other**:
  ⇨ $0.7300 US =
  $1.00 US **divided by** $1.3699 US

Expected Price - Live Cattle

Assumptions:

- Sell April @ $70.00 US/cwt.
- Exchange rate $1.35 Cdn.
- Adjusted basis $5.00 Cdn/cwt Under.

The target price is as follows:

$70.00 US X $1.35 Cdn/US$ =	$94.50 Cdn/cwt
Average adjusted basis	($5.00) Cdn/cwt
Expected Price	**$89.50 Cdn/cwt**

Note: The US price can also be converted to Cdn funds by dividing by the exchange rate in US$, i.e., $70.00 US/($0.74 US/Cdn$).

Short Cattle Hedge - Exchange rate $1.35 Cdn.

Assumptions:

- Sell April @ $70.00 US/cwt.
- Adjusted basis $5.00 Cdn/cwt Under.

	Price Increase	Price Decrease
March 15: (a) Long April	$114.75 Cdn/cwt	$81.00 Cdn/cwt
(b) Basis = c-a	($5.00) Cdn/cwt	($5.00) Cdn/cwt
(c) Cash Sale Price	$109.75 Cdn/cwt	$76.00 Cdn/cwt
(d) Futures Gain/(Loss)*	($20.25) Cdn/cwt	$13.50 Cdn/bu
(e) Net Price = c+d	$89.50 Cdn/cwt	$89.50 Cdn/cwt

*Gain/(Loss)= ($70.00 US/cwt-April futures price ($US/cwt) in March) X $1.35 Cdn/US$ i.e., ($70.00-$85.00)x1.35=($20.25 Cdn)

Short Cattle Hedge - Exchange rate $1.25 Cdn.

Assumptions:

- Sell April @ $70.00 US/cwt.
- Adjusted basis $5.00 Cdn/cwt Under.

	Price Increase	Price Decrease
March 15: (a) Long Nov	$106.25 Cdn/cwt	$75.00 Cdn/cwt
(b) Basis = c-a	($5.00) Cdn/cwt	($5.00) Cdn/cwt
(c) Cash Price	$101.25 Cdn/cwt	$70.00 Cdn/cwt
(d) Futures Gain/(Loss) *	($18.75) Cdn/cwt	$12.50 Cdn/cwt
(e) Net Price = c+d	$82.50 Cdn/cwt	$82.50 Cdn/cwt

* Gain/(Loss) = ($70.00 US/cwt-April futures price ($US/cwt) in March) X 1.25 i.e., ($70.00-$85.00)x1.25 = ($18.75 Cdn)

Futures & Basis:
Variable Exchange Rate

	Futures US$	Exchange Cdn$/US $	Futures Cdn $	Cash Price Cdn $	Adjusted Basis Cdn $
Price Rises	85.00	$1.350	114.75	109.75	-5.00
	85.00	$1.250	106.25	101.25	-5.00
Price Falls	60.00	$1.350	81.00	76.00	-5.00
	60.00	$1.250	75.00	70.00	-5.00

Hedging the Exchange Rate - Producer

- The hedger's risk - price will fall:
  ⇨ **Exchange rate risk** - dollar will appreciate.

- Hedge the risk:
  ⇨ Long position **(buy)**

Hedging The Exchange Rate - Inputs

- The hedger's risk - price will rise:
  ⇨ **Exchange rate risk** - dollar will depreciate.

- To hedge:
  ⇨ Short position **(sell)**

Number of Canadian $ Contracts

- Canadian dollar contract = $100,000
- $100,000 ÷ by the Canadian value of the commodity

Canadian $ and Short Cattle Hedge

(Appreciating Cdn $)

	April Cdn $ Futures	April Cattle Futures
September: Long Cdn $ short cattle	$1.00 US=$1.35Cdn or $.7408 US = $1.00 Cdn	$70.00 US/cwt = $94.50 Cdn/cwt
Cattle: Expected adjusted basis **Expected net price**		($5.00 Cdn)/cwt **$89.50 Cdn/cwt**
March: Short Cdn $ long cattle	$1.00 US=$1.25Cdn or $.8000 US = 1.00 Cdn	$60.00 US/cwt = $75.00 Cdn/cwt
Cattle: Futures price Adjusted basis Selling futures Price Cattle Hedge Result* **Final Net Price**		$75.00 Cdn/cwt ($5.00 Cdn)/cwt $70.00 Cdn/cwt $12.50 Cdn/cwt **$82.50 Cdn/cwt**
Gain/loss	$.0592 US	($7.00Cdn/cwt)
Contract size	$100,000	800cwt (2 contracts)
Profit/loss	$5,920 US	
	$7,400 Cdn	($5,600Cdn)

Hedge result = ($70.00 US/cwt-$60.00 US/cwt)$1.25 Cdn/US$

Canadian $ and Short Soybean Hedge

(Appreciating Cdn $)

	Dec Cdn $ Futures	Nov Soybean Futures
April: - short soybeans - long Cdn$	$1.00 US=$1.35Cdn or $.7408 US = 1.00 Cdn	$7.00 US/bu = $9.45 Cdn/bu
Soybeans: Expected adjusted basis Expected Net Selling price		($0.14) Cdn/bu $9.31 Cdn/bu
October: - long soybeans - short Cdn$	$1.00 US =$1.25Cdn or $0.80 US=$1.00 Cdn	$5.40 US/bu = $6.75 Cdn/bu
Soybeans: Selling Futures Price Adjusted basis Final Cash Price Soybeans Hedge Result **Final Net Selling Price**		$6.75 Cdn/bu ($0.14) Cdn/bu $6.61 Cdn/bu $2.00 Cdn/bu **$8.61 Cdn/bu**
Gain/loss	$.0592 US	($.70 Cdn/bu)
Contract size	$100,000	10,000bu (2 contracts)
Profit/loss	$5,920 US	
	$7,400 Cdn	($7,000Cdn)

Hedge result = ($7.00 US/bu-$5.40 US/bu)$1.25 Cdn/US$.

Canadian $ and Long Corn Hedge

(Depreciating Cdn $)

	June Cdn $ Futures	May Corn Futures
January: short Cdn $ long corn	$1.00 US=$1.35Cdn or $.7408 US = 1.00 Cdn	$3.00 US/bu = $4.05 Cdn/bu
Corn: Expected adjusted basis Expected Purchase price		+ $0.20 Cdn/bu $4.25 Cdn/bu
April: Long Cdn $ short corn	$1.00 US =$1.43Cdn or $0.6993 US=$1.00 Cdn	$3.60 US/bu = $5.15 Cdn/bu
Corn: Futures Price Adjusted basis Final Cash Price Corn Hedge Result **Final Net Purchase Price**		$5.15 Cdn/bu +$0.20 Cdn/bu $5.35 Cdn/bu ($.858 Cdn)/bu **$4.492 Cdn/bu**
Gain/loss	$.0415 US	($.242 Cdn/bu)
Contract size	$100,000	20,000bu (4 contracts)
Profit/loss	$4,150 US	
	$5,934.50 Cdn	($4,840Cdn)

Hedge result = ($3.00 US/bu-$3.60 US/bu)$1.43 Cdn/US$.

Options on Canadian Exchange Rate

(Exchange Rate at $0.73 US)

Canadian Dollar	$US per $1.00 Cdn	Option Expiry Value (strike = $0.73US)	
		Put Option	Call Option
Weaker Dollar	0.70	In-the-Money	No Value
Stronger Dollar	0.75	No Value	In-the-Money

Chapter Summary

- Can hedge with futures or option contracts.

- Adjusted Basis removes the exchange rate effect.

- Commodity's price may fall:
  ⇨ value of Cdn dollar may rise.

- Commodity prices will rise:
  ⇨ value of the Cdn dollar may fall.

Exchange Rate Risk Questions

a) **What is the nature of the exchange rate risk on the cattle edge?** *That the exchange rate will rise.*

b) **What is the nature of the exchange rate risk on the corn edge?** *That the exchange rate will fall.*

c) **How much net exchange rate exposure does the feedlot operator have?** *$83,333.33*
(4 cattle contracts X 40,000 lbs X 0.75) ÷ $0.72 = $166,666.66
(4 corn contracts X 5,000 bu X $3.00) ÷ $0.72 = ($ 83,333.33)
$ 83,333.33

d) **How can the feedlot operator hedge it?**
By buying one futures contract of dollars or one mini contract. In the first case, the hedge position will be greater than the exposure. In the second case, the hedge position will be less than the exposure.

e) **Does the exchange rate exposure change in April when the corn hedge is liquidated? If it does, how does the feedlot operator hedge this new position?**
Yes, because the short dollar risk will no longer exist. The amount of the exposure will depend upon the cattle futures price and the exchange rate when the corn hedge is lifted. The new position would be hedged by adding a mini contract or a full dollar contract.

Canadian $ and Local Long Hedge

	_____ Cdn $ Futures	_____ Futures
Date: _____ Short Cdn $ Long _____		
Commodity: _____ Expected adjusted basis Expected Purchase price		
Date: _____ Long Cdn $ Short _____		
Commodity: _____ Futures Price Adjusted basis Final Cash Price Hedge Result **Final Net Purchase Price**		
Gain/loss		
Contract size		
Profit/loss		

Canadian $ and Short Hedge

	_____Cdn $ Futures	_____ Futures
Date: _____ - Short_____ - Long Cdn$		
Commodity:_____ Expected adjusted basis Expected Selling price		
Date: _____ - Long _____ - Short Cdn$		
Commodity:_____ Futures Price Adjusted basis Final Cash Price Hedge Result **Final Net Selling Price**		
Gain/loss		
Contract size		
Profit/loss		

CASH MARKET CONTRACTS

Overview

Many of the cash market contracts, for both grain and livestock are tied to the futures and/or options markets. Their purpose and objective is to offer the producer marketing alternatives and tools that can be incorporated into the farm manager's marketing plans and strategies. It is important to highlight both the benefits and risks associated with each type of contract so that managers can make informed decisions about which tool to use.

This Chapter will provide a brief examination of the key business events that take place during the sale of a commodity including: delivery, pricing, title transfer and settlement. Contracting methods used to reduce the risk associated with each element of the transaction are reviewed and the merits of each are compared to other alternatives. Consideration will also be made for the fact that parallel business events are occurring in the futures markets simultaneously. The potential linkage with the futures market will be discussed as well. For example, since a forward contract made by a farmer with an elevator is accompanied by the elevator's short hedge, the farmer needs to know that the elevator will have margin calls in a rising market. This is why the farmer is held financially responsible if the forward contract is breeched.

Objectives

At the end of this Chapter, the participants will recognize:

1. Key business events that take place in a cash marketing transaction.

2. Various methods of reducing risk within each of the key cash market events.

Suggestions to Facilitator

Cash market contracts involve a delivery commitment or acceptance of a specified quality within a specified time frame. **It should be stressed to the participants, that because of production risk, grain and oilseed producers will likely limit the use of these contracts to a portion of their expected production ahead of harvest.**

Begin the Chapter by discussing each of the four key business events:

Delivery: ⇨ physical transfer of a commodity from seller to buyer.
Pricing: ⇨ agreement on an acceptable price by buyer and seller.
Title transfer: ⇨ actual transfer of ownership.
Settlement: ⇨ payment from buyer to seller.

The following cash market contracts are discussed in the manual:

- Deferred Delivery/Forward Contract (Sale),
- Deferred Delivery/Forward Contract (Procurement),
- Basis Contracts,
- Grain Pricing Order,
- Delayed or Deferred Pricing (90 day tickets in Western Canada),
- Hedge to Arrive/Futures Only Contracts,
- Deferred Payment,
- Bank Swaps.

Review each of the cash contracts which are listed in the manual, as well as any cash contracts which are used locally. Discuss each contract in terms of "**key business events**". Make sure to discuss the cash price in relation to the basis and the futures price.

Discuss the flexibility of each contract, the costs of each alternative and the ability of the user to obtain a better price. This is useful to the participants, in terms of being able to select the best strategy. It is important to stresses the importance of compliance, in either making or taking delivery.

In the concluding chapter, two overheads have been provided which compare the various risk management tools. It is important that the facilitator provides a thorough coverage of these contracts in this chapter, in order for the participant to focus their attention on the risks and attributes of each tool in the last chapter.

List of Overheads

Visual aids for this chapter include:

Overhead #	Title
1.	Chapter Objectives.
2.	Key Business Events Cash Market Tools.
3.	Deferred Delivery/forward Contract (Producer) (2).
5.	Deferred Delivery/forward Contract (Inputs).
6.	Basis Contracts (2).
8.	Grain Pricing Order (2).
10.	Delayed or Deferred Pricing (2).
12.	Hedge To Arrive Contracts (2).
14.	Deferred Payment .
15.	Bank Swaps.
16.	Chapter Summary.
17.	Questions and Exercises.

Exercises:

Discuss and list the reasons why buyers might choose to contract their inputs?

- security of supply
- concerned about rising prices which may reduce their profitability
- to meet sales commitments, i.e., feed, ethanol, flour, oil, meal, etc.

US buyers are offering $100 US/mt for corn delivered to northern Minnesota elevators for two month period, November 1 through December 31. During that time, the value of the Canadian dollar moves from $0.728 US to $0.75 US.

What impact would the change in the Canadian dollar have on the corn producer's returns during this period if the exchange rate was unhedged?

Returns in Canadian dollars from sale would be less than originally anticipated when entered into sale.

If the producer had a bank swap that assured an exchange or conversion rate of $0.728 US?

Would have received in Canadian dollars what was expected when the sale was made.

$100 US/mt ÷ $0.728 = $137.36 **NOT** $100 US/mt ÷ $0.750 = $133.33

Overheads For This Section

Chapter Objectives

- Review of key business events
- Review of cash market tools

Key Business Events - Cash Market Tools

- Delivery:
  ⇨ physical transfer of the commodity

- Pricing:
  ⇨ agreement on price

- Title transfer:
  ⇨ transfer of ownership

- Settlement:
  ⇨ payment

Deferred Delivery/Forward Contract

Commodity Producer:

- Quantity, quality and delivery period specified.

- Price is set:
  ⇨ futures ± basis

- Delivery commitment

- Purchaser has short futures position.

Deferred Delivery/Forward Contract

Pros & Cons:

- No margin calls.
- Price is "locked in".
- Forfeits any market gains.

Deferred Delivery/Forward Contract

Inputs:

- Price of the input is fixed in advance.

- Quantity, basis, delivery period and quality established.

- Acceptance commitment by buyer.

- Supplier establishes long futures position.

Basis Contracts

- Sale or purchase of a commodity
- Delivery period, futures contract, quantity and quality established
- Basis is fixed
- Lock in futures price level at a later date
- Delivery/acceptance commitment

Basis Contracts

Pros & Cons:

- Speculates on the price level.
- Used when adverse basis change expected.
- Splits the pricing decision into basis and price.
- No final price is established initially.
- Forfeits any opportunity of a basis improvement.

Grain Pricing Order

- Similar to a market order on futures.
- Basis is included in the calculation.
- Used primarily to determine selling level.
- The net cash price is selected and basis is added (deducted).
- Determines futures price to be sold by a specified date.
- Traded executed if futures price meets specified price:
  - ⇨ deferred delivery contract or cheque is issued.

Grain Pricing Order

Pros & Cons:

- Price not met by expiry, no delivery is required.
- Contract used to target higher prices.
- No protection against declining prices.
- No opportunity to gain on the basis.
- Useful if you can't watch the market closely.

Delayed or Deferred Pricing

- Delivery and title transfer
- Pricing & payment delayed
- No basis or price established
- No payment until price is established or 90 days expire.

Delayed or Deferred Pricing

Pros & Cons:

- Risk of adverse futures price movements
- Risk of adverse basis changes
- Problems seasonal basis levels are wide or will widen.

Hedge to Arrive Contracts

- It is usually done for short hedges.
- There is no basis determined.
- The delivery period is usually specified:
  ⇨ some contracts allow rolling to another position.
- The futures price is established.

Hedge To Arrive Contracts

Pros & Cons

- The company pays the margin calls.
- There is delivery expected.
- Basis risk

Deferred Payment

- Delivery, title exchange and pricing occurs.

- Settlement deferred until a later date:
  ⇨ usually for tax purposes.

- Used with other cash market contracts at settlement.

Bank Swaps

- Forward exchange contracts.
- Off-setting balance is established

Chapter Summary

- Risk management tools available from suppliers and processors

- Risk of a price decline in the cash market:
  ⇨ forward sales contract at fixed price.

- Risk of a price increase in the cash market:
  ⇨ forward purchase contract with supplier.

- Legally binding agreements:
  ⇨ understand the terms of the contract.

Questions and Exercises

Question:

Discuss and list the reasons why buyers might choose to contract their inputs?

- *Security of supply*
- *Concerned about rising prices which may reduce their profitability*
- *To meet sales commitments, i.e., feed, ethanol, flour, oil, meal, etc.*

Exercise:

What impact would the change in the Canadian dollar have on the corn producer's returns during this period if the exchange rate was unhedged?

Returns in Canadian dollars from sale would be less than originally anticipated when entered into sale.

If the producer had a bank swap that assured an exchange or conversion rate of $0.728 US?

The producer would have received in Canadian dollars what was expected when the sale was made.
$100 US/mt ÷ $0.728 = $137.36 ***NOT*** *$100 US/mt ÷ $0.750 = $133.33*

SUMMARY COMMENTS

Overview

Today's marketing environment is continually changing and there is an increasing emphasis on risk management. As outlined in the previous chapters, there are various tools which can be used to manage risk. The degree to which any of these tools are used is largely dependent on each individual's financial situation and risk attitudes. Each tool has its own advantages and disadvantages.

Suggestions to Facilitators

The focus of this course has been on the use of futures, options and cash contracts to limit risk as it relates to price, cash flow, gross margin and ultimately the financial viability of an operation. The previous chapters covered a number of tools which can be used to protect against a price decline, alone or in combination, on any proportion of the commodity up to 100%. Similar strategies may be used to limit the risk of higher input costs.

In the previous chapters we looked at the various risk management tool individually. The purpose of this chapter is to bring this information together in order to explain to the student what it all means. How we propose to do this is to take two examples, a price increase and a price decrease, and compare the financial outcome of each, for a unhedged producer, with the financial position of a producer who hedged with futures and a producer who has hedged with options. This will has allow the participants compare the outcome for each risk management tool in a given market situation. We then repeat the same exercise for the input side. **Note that the graphs for overheads 3 & 5 appear to be the same but, the axis has been reversed and they are in fact different.**

We have included two summary tables at the end of this chapter which compares the advantages and disadvantage of each risk management tool.

List of Overheads

Visual aids for this chapter include:

Overhead #	**Title**
1.	Summary Comments.
2.	Risk of Lower Commodity Prices.
3.	Hedging Versus Cash Markets.
4.	Risk of Higher Input Costs.
5.	Hedging Versus Cash Markets.
6.	The First Steps.
7.	Tools For Protection From Price Declines.
8.	Tools For Protection From Rising Prices.

Overheads For This Section

Summary Comments

- Effectiveness of management tools:

  ⇨ Contract specifications and commodity similarities;

  ⇨ Basis fluctuations;

  ⇨ Delivery obligations;

  ⇨ Grades; and

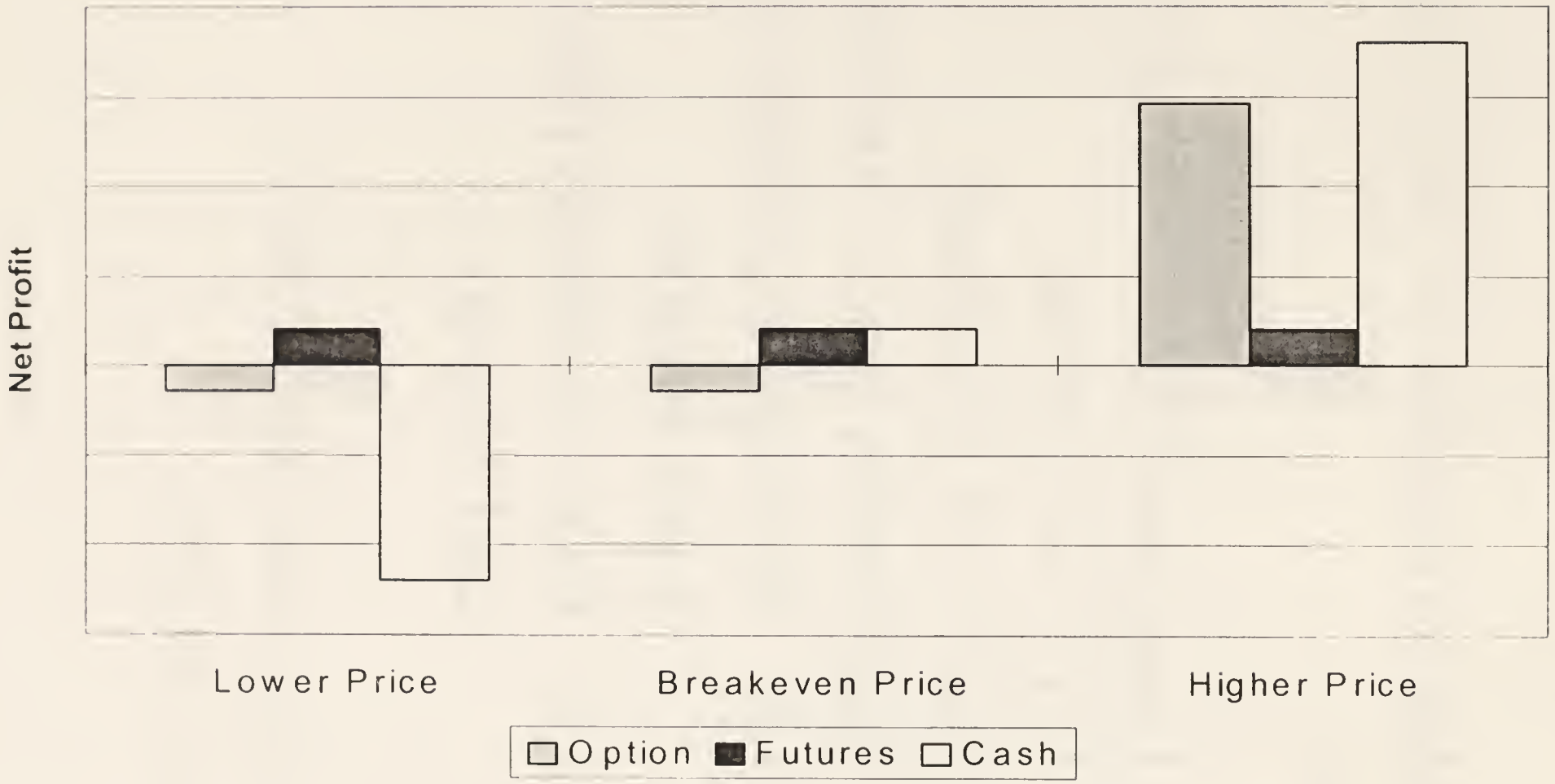
  ⇨ Exchange rate.

Risk of Lower Commodity Prices

- Tools to protect against a price decline:
  - ⇨ Short position in futures market;
  - ⇨ Put option;
  - ⇨ Deferred delivery;
  - ⇨ Minimum price contracts:
    - (I) deferred delivery plus buy a call option;
    - (ii) basis contract plus buy a put option.

- Alone or in combination.

Hedging Versus Cash Markets



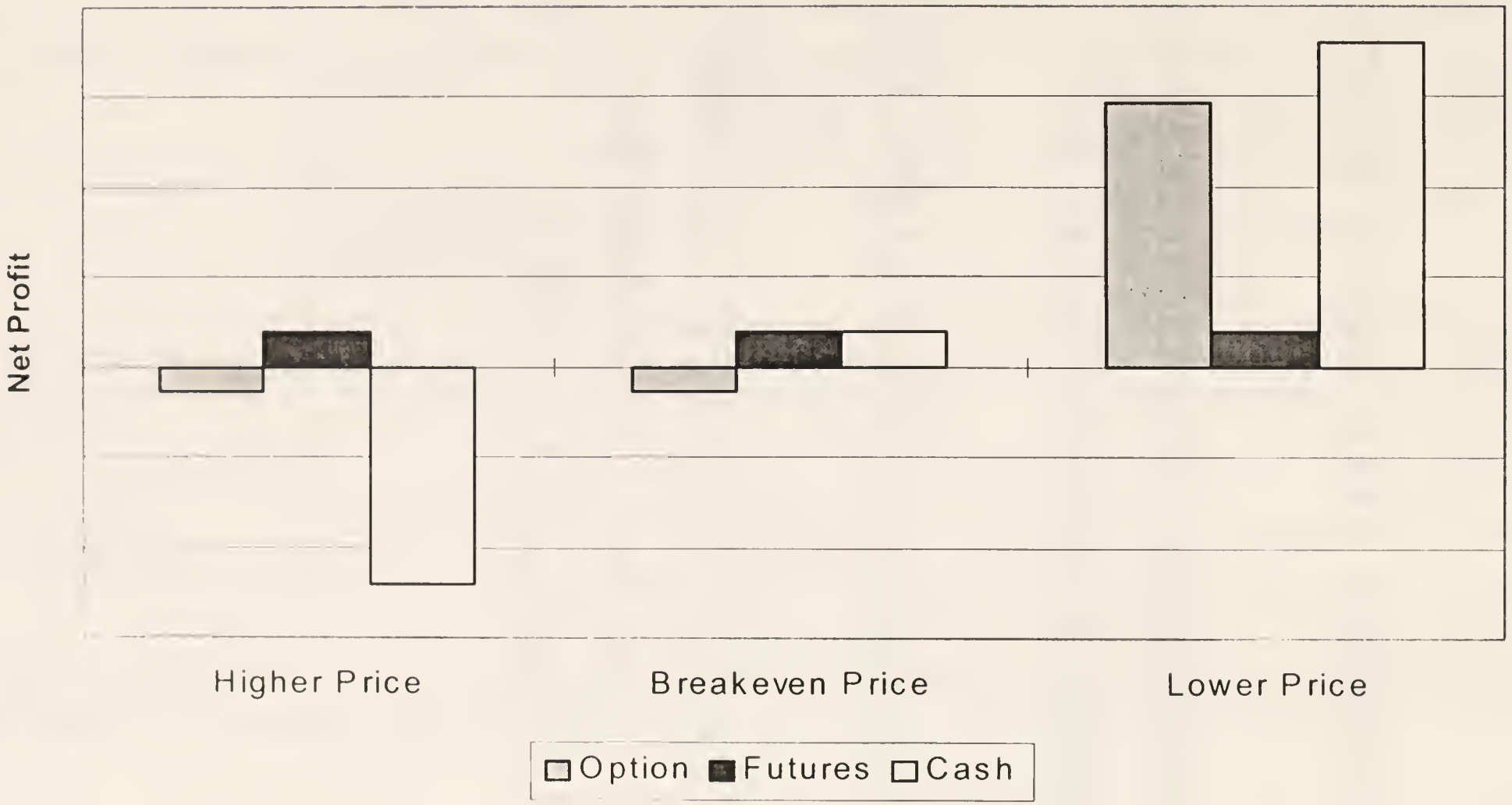
Risk of Higher Input Costs

- Similar strategies to limit input costs:

  ⇨ Long position in futures;
  ⇨ Buy call option;
  ⇨ Forward purchase;
  ⇨ Maximum price contracts:
    (i) forward purchase plus buy a put option;
    (ii) basis contract plus buy a call option.

- Can be used alone or in combination.

Hedging Versus Cash Markets



The First Steps

- Calculate your break-even.
- Determine expected results of each hedge if prices rise or fall.
- Why hedge when expect a loss?
- Which tool is appropriate?
  - ⇨ market expectations;
  - ⇨ attitude to risk.

TOOLS FOR PROTECTION FROM PRICE DECLINES					
				Minimum Price Contracts	
	Short Futures	**Deferred Delivery (Forward Contract)**	**Long "Put"**	**Long "Put" + Basis Contract**	**Deferred Delivery + "Call"**
Costs	• risk of margin calls	• no margin calls	• no margin calls, pay option premium	• no margin calls, pay option premium	• no margin calls, pay option premium
Price	• futures price locked in	• cash & futures price locked in	• price protected at strike price minus premium	• cash price protected at strike price minus premium ± basis	• delivery price fixed at deferred delivery price less premium
Basis	• basis not covered	• basis fixed, no opportunity to gain from basis improvement	• basis not covered	• basis fixed, no opportunity to gain from basis improvement	• basis locked in
Speculation	• no advantage from price improvement (gain)	• no advantage from price improvement	• can take advantage of price improvement	• can take advantage of price improvement	• can take advantage of price improvement above CALL strike price
Delivery	• no delivery commitment	• delivery commitment	• no delivery commitment	• delivery commitment	• delivery commitment

Basis contract does not give protection from price declines or price increases. Only an adverse change in basis is protected in basis contract. Cannot benefit from favourable change in basis.

TOOLS FOR PROTECTION FROM RISING PRICES

				Maximum Price Contracts	
	Long Futures	**Forward Purchase**	**Long "CALL"**	**Long "CALL" + Basis Contract**	**Forward Purchase + "PUT"**
Costs	• margin calls	• no margin calls	• no margin calls, pays option premium	• no margin calls, pays option premium	• no margin calls, pay option premium
Price	• futures price locked	• price locked in	• maximum futures price at strike price + CALL premium	• maximum cash price set at strike price + CALL premium ± basis	• maximum price set at forward purchase contract price + PUT premium
Basis	• basis risk	• basis fixed	• basis not covered	• basis fixed so can't take advantage of basis improvement	• basis fixed
Speculation	• no opportunity to take advantage of price improvement (decline)	• no opportunity to take advantage of basis or price improvement	• take advantage of basis and price improvement	• take advantage of price improvement but not basis	• take advantage of lower prices through PUT premium appreciation if futures fall
Delivery	• no delivery acceptance	• delivery acceptance expected	• no delivery acceptance expected	• delivery acceptance expected	• delivery acceptance expected

Basis contract does not give protection from price declines or price increases. Only an adverse change in basis is protected in basis contract. Cannot benefit from favourable change in basis.

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ADDITIONAL

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